Assessing Electronic Government Readiness of Public Organisations – Effect of Internal Factors

(Case of Egypt)

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Abstract

Governments have become more and more interested in embracing Information and Communication Technology (ICT), and have made a remarkable progress over the last few years. Electronic Government (e-government) - described as the strategic use of ICT to transform the public sector - is presently recognised as a driver and a key enabler of citizen-centric, cooperative, and seamless modern governance. E-government implementation implies not only a profound transformation in the way government interacts with the governed, but also a reinvention of its internal processes and how public organisations carry their business both internally as well as externally while interacting with the other segments of the community.

Based on the literature, it is frequently claimed that the availability of an effective E-Government Readiness (EGR) assessment framework is a necessary condition for advancing e-government proper implementation. Most e-government appraisal models address the Electronic Service (e-service) dimension of e-government that focuses on the services provided by the government to the citizens on the Internet. This gives a very narrow perspective to e-government ignoring a key dimension: the Electronic Administration (e-administration), that highlights the importance of modernising the public sector, increasing government productivity, and transforming its internal processes. Furthermore, developed models assess E-Government Readiness (EGR) on a country as a whole without conducting an in-depth assessment on a public organisation scale. In addition, the majority of these models do not take into consideration the opinion of the civil servants involved in such e-government programs, a key stakeholder that affects their success.

The objective of this thesis is to develop a framework that assesses EGR focusing on e-administration within public organisations through obtaining its employees' feedback. The suggested framework investigated the internal factors affecting EGR categorised into four dimensions: (i) strategy, (ii) people, (iii) technology, and (iv) processes. A number of measuring constructs are identified under each dimension. The framework components, relationships, and hypotheses were derived from the literature on Electronic Readiness (e-readiness), EGR, Information Systems (IS) and Electronic Commerce (e-commerce) success. In order to test the proposed framework, the thesis examined the relations and interactions of these components in an emerging e-government environment using four case studies of different characteristics to represent public organisations in Egypt. These organisations cover municipalities, investment, tax payment, and health sectors.

Quantitative data collection method was through distributing a questionnaire to a sample of employees in each organisation. Data obtained from the questionnaire in each organisation was triangulated with data gathered from other sources of evidence: (i) interviews with top management, (ii) documentations, (iii) archival records, and (iv) observations.

Findings of the empirical research were evaluated against the framework suggested in the beginning leading to a final framework that assesses EGR of public organisations. Findings revealed that framework's hypotheses were all confirmed. Concerning Egypt's EGR assessment, results proved that processes, technology, and people have a high effect on EGR, whereas strategy has a modest impact on it. This reflects that strategy is not given a high value in terms of e-government and that top management need to further promote e-government within public Egyptian organisations. Findings revealed also the modest impact of strategy on the two dimensions: technology and processes compared with its high effect on people. The research highlighted also the different measuring constructs that have the highest weights in each of the four dimensions. This helps in understanding e-government environment of public organisations in Egypt, showing the main components that affect EGR.

The thesis though provides a rich insight into investigating e-administration within public organisations especially in a developing country such as Egypt, and presents a systematic approach to assess EGR of public organisations based on the four e-government building blocks: (i) strategy, (ii) people, (iii) technology, and (iv) processes. Therefore the thesis contributes to research areas in the literature related to assessments of information systems, e-commerce, e-readiness, and e-government readiness.

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"The idea of reengineering through technology is critical. We didn't want to automate the old, worn processes of government. Information technology (IT) was and is the great enabler for reinvention. It allows us to rethink, in fundamental ways, how people work and how we serve customers."

(Albert Arnold "AL" Gore, Jr., 1997, Vice President Of United States of America)

1. Introduction

Objectives of chapter 1

- Introduce and provide a context for the thesis.
- Describe the foundation of and the motivation for the research.
- Discuss the problem addressed by the thesis.
- Outline the aim and objectives of the thesis.
- Summarise the research process.
- Identify the areas of research to which the thesis contributes.
- Provide the rationale for the organisation of the thesis' chapters.

Electronic Government (e-government) - simply described as the strategic use of Information and Communication Technology (ICT) to transform the public sector (Phang et al., 2008) - has started in the late 1990s (Chan and Pan, 2008). It is already a reality expected to draw further interest among both academic and business communities (Alican, 2007). The benefits perceived by Electronic Commerce (e-commerce) (such as, convenient access to information and to more products and services, efficient customer service, ability to customise products and services, easy and fast transactions, cheaper products and services, etc.) have raised the level of expectations of citizens, demanding faster, better and more access to government services (Krishnaswamy, 2005), and providing the flexibility and client focus of the private sector (Grönlund and Horan, 2004; Flak and Rose, 2005; Lee et al., 2005). Governments anticipate similar increases in efficiency, productivity improvements and cost savings similar to those experienced by the private sector (Stamoulis et al., 2001; Clark, 2003).

E-government implementation can realise considerable benefits such as provide citizens and organisations with better information and services (Grönlund, 2002; Fountain 2005; Lam, 2005; Torres et al., 2005; Tung and Rieck, 2005), increase the efficiency of the public administration through simplifying administrative procedures and cutting costs (Bhatnagar, 2000; Dawes et al., 2004; Gilbert et al., 2004; Tung and Rieck, 2005; Zhang et al., 2005; Mayer-Schönberger and Lazer, 2007), and incorporate democratic processes

(Guerrini, 2008) through citizens' participation (Sharma, 2004). These benefits result in increasing trust in local government (Tolbert and Mossberger, 2006), and in improving government transparency, responsiveness, and accountability (Belanger and Carter, 2008).

The benefits perceived through e-government drove a large number of developed and developing countries worldwide to allocate substantial resources to implement e-government (Tassabehji, 2005). According to the United Nations Survey 2008 "From E-Government to Connected Governance", 189 out of 192 member countries (98%) operate government websites (UNDESA, 2008). However, how these benefits would be reached is still a matter of controversy (Krishnaswamy, 2005). Although most e-government researchers express optimistic views regarding the impact of e-government (Heeks and Bailur, 2007), e-government is still in an early stage (Leith and Morrison, 2004) and has not achieved many of the expected outcomes (Moon, 2002; Ke and Wei, 2004; Heeks, 2006b). Moreover, the failure rate of e-government projects was estimated somewhere between 60-80% (UNDESA, 2003b). This is mainly due to the applications which tend to reflect low levels of back-stage reengineering and inter-department cooperation in public organisations (Grant and Chau, 2005). E-government is more than a technological phenomenon; it is transformative in nature (Dada, 2006); comprising a broad spectrum of activities that are offered using ICT (Northrup and Thorson, 2003) affecting the management of human, technological, and organisational resources (Jansen, 2005; Cocchiglia and Vernaschi, 2006) and the coherent integration between them (Pappa and Stergioulas, 2005).

Given the amount of time and money being spent today on e-government, it becomes increasingly important for governments to identify measures of success and regularly monitor and evaluate performance (Stowers, 2004; Guerrini, 2008; Irani et al., 2008). E-Government Readiness (EGR) assessment is considered an important study to the success of e-government initiative. Such assessment would raise awareness, describe e-government environment, and confirm the feasibility of application of e-government approaches (UNDESA, 2003a). EGR assessment would also provide a roadmap for politicians, economists and other stakeholders to guide them towards the right direction (Jansen, 2005). In addition, assessing the impact of ICT on the back office of public organisations would reveal several aspects that may not be perceived otherwise.

Benchmarking e-government initiatives has been developed and studied for around a few years (Salem, 2007), but it is argued that such initiatives do not provide a comprehensive and unifying framework (Esteves and Joseph, 2008) that may help to assess, classify and

compare different e-government programs (Hu et al., 2005; Grant and Chau, 2005). This is attributed to the fact that information systems in the public sector are a process of experiential and subjective judgment grounded in opinion and world views (Irani et al., 2005). There is still a need for an "efficient EGR framework" (Ojo et al., 2007) to allow for assessment, comparison and explanation of current efforts to vis-à-vis past and future investments in the e-government enterprise and on increasing cross functional efficiencies (Grant and Chau, 2005).

The aim of this thesis is to fill the research gap in assessing E-Government Readiness (EGR) of public organisations. Most assessment approaches of Electronic Readiness (e-readiness) and EGR are more suitable for the appraisal of the overall development of e-government; they are not directly focusing on the problems that exist in e-government projects or on the internal factors affecting a public organisation. Furthermore, most of these approaches ignore the view of civil servants (Heeks, 2006a) even though they constitute the cornerstone in the success of any e-government project as the direct users.

The research process started by investigating the appraisal frameworks and models available in the literature. E-readiness assessment models were discussed before the major EGR assessment ones. Such approach was taken given the fact that e-readiness is the foundation area of EGR, and that the e-readiness concept – investigated prior to EGR – reached satisfactory common grounds among both researchers and governments. Both e-readiness and EGR models were analysed, their deficiencies were pointed out and by drawing on their merits, and on a number of models addressing Information Systems (IS) and e-commerce success, the research developed an EGR framework of e-government project success focusing on electronic management. Although being a principal dimension of e-government, electronic management is often slighted because it is mostly invisible to the public but should not be ignored by governments (Dawes, 2002). Since implementation of e-government takes various forms, the goal of the research was to contribute to the understanding of the impact of ICT in a government organisation.

The thesis recommends that in order to reach success in developing and implementing e-government, public agencies should realise the importance and interrelation between all e-government building blocks which are: (i) strategy, (ii) processes, (iii) technology, and (iv) people. An EGR framework is proposed encompassing all these issues, and then

tested by getting feedback from the employees working in a number of public sector organisations in Egypt.

Apart from the availability of case studies and reasonable access to data for this research study, Egypt was also selected as a very suitable environment for e-government research due to several reasons:

- The lack of research pinpointing the potential of e-government in developing countries (Corea, 2007; Gupta et al., 2008). Compared to developed countries, different issues related to the context within which e-government is implemented (such as institutional, cultural, and administrative) "has not received adequate attention in the e-government literature" (Nour et al., 2008). This requires the need for additional research and proposed approaches (Ndou, 2004; Schuppan, 2009), and Egypt is no exception.
- The slow progress in e-government adoption in developing countries compared to developed ones (Sagheb-Tehrani, 2007) in addition to the high failure rate of e-government in them (Heeks, 2003). Such facts instigate the requirement of further research to investigate this unexplored issue (Dada, 2006) and to identify the critical success factors affecting EGR in developing countries.
- The progress that Egypt has achieved in e-government based on the only two benchmarks that included Egypt in their rankings[1]: West (2007, 2008) and UNDESA (2005, 2008). Since the benchmarking criteria in both reports focus on the nations' websites without any attention directed to the back office, this progress in e-government in Egypt raises the following question: is this improvement reflected in e-management as well? Do public organisations in Egypt have the suitable foundation to support the front office, or that the official Egyptian portal providing online services is just an external layer that is not incorporated in the bone of the overall system in public organisations?

The results obtained from the empirical research were used to verify the viability of the suggested framework in terms of the suggested dimensions (strategy, processes, technology, and people) and their classification. Furthermore, findings provided an assessment of EGR in Egypt (indicating the weight of each dimension), presented in-depth investigation of the degree of involvement of employees in shaping e-government

[1] Assessment criteria in both benchmarks are explained in chapter 2: Literature Review, section 2.3. Egypt's rank in each benchmark is provided in chapter 5: Case Studies, section 5.1.

initiatives, and indicated the extent of communication between top management and employees in public organisations in Egypt.

1.1 The problem being addressed and the research question

Reviewing studies on e-readiness, E-Government Readiness (EGR), IS and e-commerce success factors reveals the existence of a research gap if one's aim is to assess internal factors affecting EGR. The majority of previous studies perform their assessment based on a national scale. As for the small number of research assessing EGR on a micro level, i.e. within a public organisation, they are not considering all internal factors affecting EGR; moreover they are conducted on developed countries without verifying their applicability on a developing country such as Egypt. This led to the following research question:

> What is the framework that could best assess E-Government Readiness (EGR) encompassing all internal factors affecting e-government within a public organisation?

The literature investigated can certainly be useful as a foundation for further research to fill this research gap.

1.2 The thesis aim and objectives

The previous section discussed the issues that were addressed in this thesis leading to the presentation of the research question. The research question is the starting point that determines the research aims and objectives.

Based on the research question, the thesis aim was to identify all the internal building blocks of E-Government Readiness (EGR) of a public organisation as well as the relations between them. This aim was reached through attaining the following distinct but closely related objectives:

1. Research the concept of e-government and the different ways it is perceived.
2. Derive from the literature the critical success factors for EGR along with the constructs that aid in measuring each factor.
3. Extract only the internal factors that affect EGR of public organisations (i.e. excluding external factors affecting EGR that are related to the whole country such as, economical, political, regulatory, etc.).
4. Build a primary EGR assessment framework presenting the specified factors along with suggested relations between them.

5. Compile a list of the organisations used as case studies for the empirical research based on their suitability in representing the main characteristics of public organisations in Egypt.
6. Conduct empirical research on the selected case studies.
7. Compare the empirical research findings with the different components of the primary framework that was developed earlier (step number 4).
8. Refine the primary framework based on the results obtained from the empirical research.

1.3 Research process

Once articulated, the research objectives directed the researcher to the appropriate approaches to be embraced in order to reach them. To achieve these objectives it was necessary to gather a variety of data about different aspects of the problem addressed in the thesis, and to analyse this data using different techniques.

Theory building

An initial research foundation was formed in terms of an investigation of e-readiness and EGR assessments. Analysis of these assessment models indicated their several shortcomings and their inadequacy in assessing EGR of public organisations; this lead to undertaking a second literature review phase in the areas of e-commerce and information systems success. Although all models described in the literature do not address all factors affecting EGR, they served as a theoretical foundation to determine such factors. The identified factors were then used to define a set of requirements for EGR assessment and to develop a preliminary framework that assesses EGR within a public organisation.

Empirical research

In order to test the suggested framework, an empirical research was conducted in a number of public organisations in Egypt. A case study research strategy was selected since it is a well known approach for exploratory, theory-building research (Eisenhardt, 1989) allowing in depth investigation (Pettigrew, 1990; Walsham, 1993; Yin, 1993; Majchrzak et al., 2000; Shane, 2000; Krogh et al., 2003; Chen and Hirschheim, 2004). Both quantitative and qualitative data were collected. Quantitative data served in testing the research hypotheses statistically attempting to cover a sample of employees in public organisations in Egypt. The research gathered also qualitative data to obtain a profound insight into the situation of e-government in the case studies investigated. Both kinds of data were compared for the purpose of triangulation to confirm the validity of the findings acquired from the empirical research (Ragin, 1987; Yin, 2002; Saunders et al., 2000; Sarker and Lee, 2003; Davison et al., 2004; Johnson and Onwuegbuzie, 2004).

Quantitative data was collected through distributing a questionnaire on a sample representing employees working in administrative positions. Qualitative data was collected through in-depth unstructured and semi-structured interviews (Yin, 2002; Malterud, 2001; Dube and Pare, 2003) with top management, key people, and with a number of employees. Interviews were combined with observations of the workplace, and with a review of documents and archival records available in the public organisations studied.

Figure 1.1 presents an illustration of the overall research process that was adopted to reach the aim and objectives of the thesis. The foundation for this research study was on EGR assessment. In the beginning, a literature review provided early hypotheses regarding EGR of public organisations forming a preliminary framework. In order to test the proposed framework, data was gathered from a number of selected public organisations in Egypt. Results obtained from the empirical research served in evaluating them against the primary framework derived from the literature leading to a revised conceptual model of EGR assessment of public organisations in Egypt. The final stage comprises the main ideas concluded from the entire research highlighting the research contributions of this thesis.

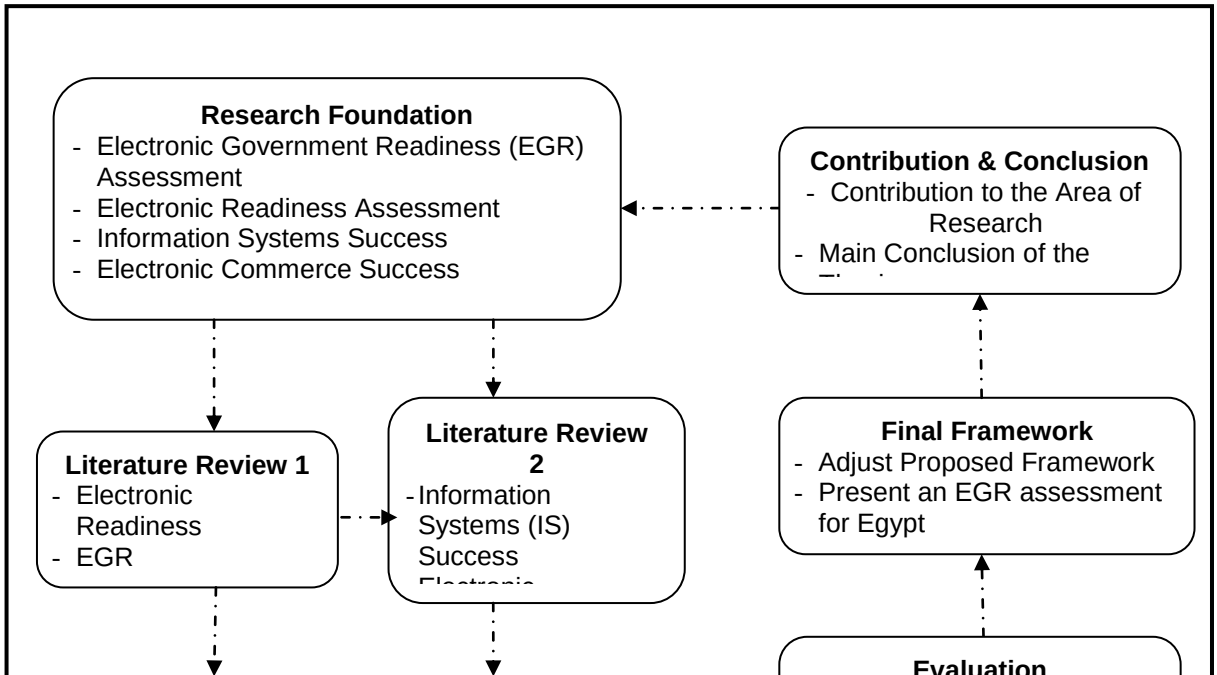


Figure 1.1

Figure 1.1 - Overall Research Process

1.4 Contribution towards Electronic Government (e-government)

The different stages of the research process led to the development of a systematic approach to assess EGR of public organisations. Such aim definitely contributes to e-government; a still immature field (Hu et al., 2005) lacking formal theory development and testing (Heeks and Bailur, 2007); and in which many perspectives are still unexplored (Esteves and Joseph, 2008). Further studies in this direction evidently enrich knowledge in such domain as it merges traditional modelling practices in more established fields (such as IS and e-commerce) in measuring ambiguous notions, and provides conceptual models for them.

Assessing EGR of public organisations is always overlooked because the main focus of EGR assessments research is on e-government front office, underestimating the effect of the back office integration on e-government success. The reason behind this interest in the front office perspective of e-government lies in its importance in enhancing the image of government locally and internationally because: (i) existing EGR benchmarks monitored regularly by policy makers and researchers assess mainly website performance, without addressing back office related progress and efficiency; and (ii) back office efficiency is not much perceived by citizens as opposed to the presence of an official website. In addition, the focus on implementing a website and on including continuous additional services to it does not require much resources and efforts compared to those needed in improving back office performance through the use of ICT. Only recently, e-government literature (such as UNDESA, 2008 and Accenture, 2007) realised the value of the back office and tried to provide an insight into the main issues associated with it. This reflects the fact that e-administration assessment is by far less exploited, hence the inevitability to conduct this research at present.

1.5 Rationale for the organisation of the thesis

This thesis consists of eight chapters organised under three categories: research positioning (chapters 1 and 2), research body (chapters 3 to 6), and research outcomes (chapters 7 and 8). Figure 1.2 demonstrates the organisation of the thesis diagrammatically.

The first chapter (Introduction) provides the context for the thesis, highlights the research gap, presents the research question, identifies the thesis aim and objectives, and explains the research process. Chapter two (Literature Review) discusses the meaning of e-government, and investigates different e-readiness and E-Government Readiness (EGR) assessment models, as well as several IS and e-commerce success models. The chapter conducts a critique of all presented appraisal models pinpointing their shortcomings in assessing internal factors affecting EGR of a public organisation.

Chapters three, four, five, and six discuss the core research of this thesis and focus on aspects of originality. More specifically, chapter three explains the methodology that was embraced in order to realise the thesis objectives. Chapter four presents a suggested framework for assessing EGR. This chapter is directly linked with chapter two in order to provide a conceptual foundation for the proposed framework. The fifth chapter starts by highlighting the e-government initiative in Egypt. Next, the chapter presents the case studies selected for the empirical research, and discusses the rationale behind selecting them along with a description of their contexts. Chapter six reviews briefly the data analysis process (explained in detail in chapter 3: Methodology, section 3.7), analyses the data gathered from the case studies, and reports the main findings of the research.

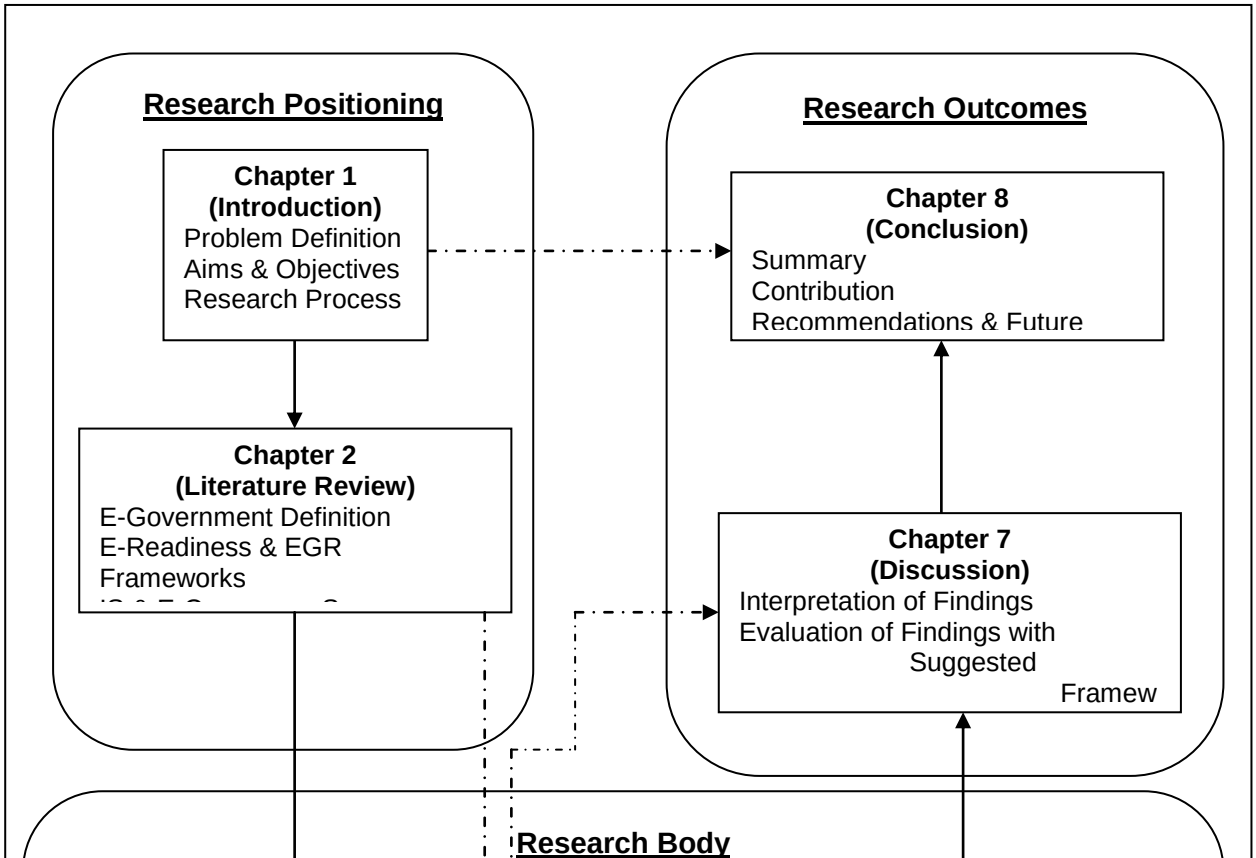


Figure 1.2 - Organisation of the Thesis

The last two chapters of this thesis present the main outcomes of this research study. Chapter seven focuses on the comparison of results obtained from the organisations studied (chapter six), with the preliminary framework presented in chapter four (suggested based on the literature of related areas of research). The results of the comparison lead to the development of a final framework. Finally, chapter eight reflects upon the thesis and considers its contribution to research in the computer science fields of information systems in general and in e-government in particular. A number of future research avenues are suggested focusing on generalising the developed framework over other contexts. The last chapter draws on the first one to confirm that the research reached its objectives, and that it answered the research question posed in the first chapter.

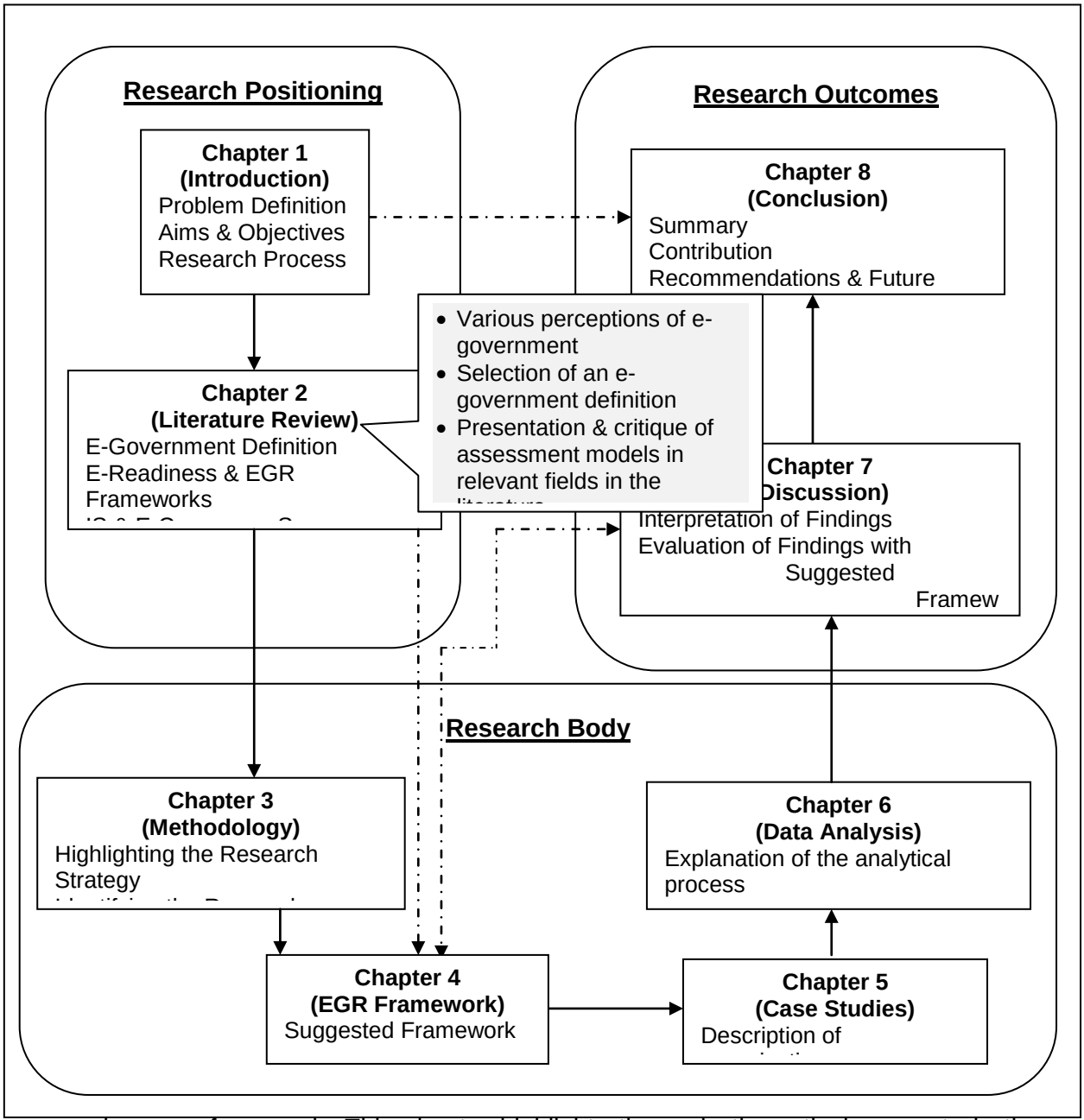
1.6 Summary

This chapter highlighted the main points of the problem being addressed leading to the research question. The aim and objectives capable of answering the research questions were defined. Also a brief introduction of the research methodology used to attain these objectives was presented explaining the overall research process. Contribution of the thesis to its relevant research area was discussed followed by an illustration of the organisation of the thesis' chapters. In the next chapter, a more-in-depth review of e-readiness, E-Government Readiness (EGR), information systems (IS), and electronic commerce (e-commerce) assessments will be undertaken, to pinpoint their inadequacy in solving the research problem. The chapter will also discuss the main factors that can be extracted from the criteria employed in the above assessments to help in developing an assessment EGR framework for public organisations.

2. Literature Review

Objectives of chapter 2

- Introduce the concept of e-government from its different perspectives.
- Investigate Electronic Readiness (e-readiness) assessment models.
- Undertake an in-depth investigation of E-Government Readiness (EGR) assessments.
- Discuss the main Information Systems (IS) success models available in the literature.
- Present existing Electronic Commerce (e-commerce) assessments.



several areas of research. This chapter highlights the main theoretical concepts in the literature related to this topic providing an insight into the research area. It starts by

introducing the meaning of e-government through presenting the different ways researchers perceive it; this leads to a deduced e-government definition that will be referred to in this thesis. Next, the chapter discusses several assessment models to check the availability of a tool to be employed in assessing EGR of a public organisation. E-readiness assessment models are first investigated, followed by other tools developed specifically for assessing EGR. E-readiness assessment models are presented due to two reasons: first e-readiness is the foundation area of EGR; and second the e-readiness concept has a standard and common understanding among both researchers and governments since research in e-readiness was investigated prior to EGR. Next, it was necessary to investigate IS and e-commerce success models since e-government is an application of Information and Communication Technologies (ICT) (Gordon, 2002) as well as of e-commerce (Guo and LU, 2005), providing opportunities for the development and use of ICT in the public sector. After conducting a critical analysis on the presented assessment models, the researcher concluded that relevant models in the literature cannot be used entirely to assess EGR of public organisations.

2.1 Definition of Electronic Government (e-government)

E-government is a concept causing debates because it does not have a common meaning for all researchers and stakeholders (Seifert and Relyea, 2004). Due to the fact that e-government is a multidimensional, multidisciplinary, and immature field (Jaeger, 2003), as well as the existence of different e-government implementation approaches, it is becoming increasingly difficult to set a common definition (Roy, 2003). There exists a number of different definitions of e-government in the literature, ranging from being too narrow and specific into extremely general and broad, reflecting different meanings and definitions to different people. Narrow e-government definitions focus only on using ICT particularly the Internet (Turban et al., 2002), whereas broader definitions consider ICT as a mean towards better government practices (OECD, 2003a). Such 'better government' increases efficiency of public services (E-Europe, 2005), improves citizen participation (Janakova, 2004, OECD, 2003b), and ensures electronic availability of all internal and external government activities (NAO, 2002).

Other broad definitions view e-government as the use of ICT, particularly the Internet, as a tool to achieve better government (The Organization for Economic Cooperation and Development-OECD, 2003a; 2003b), or smarter government (Netcaucus, 2001). Furthermore, The World Bank (2003) sees that ICT is used mainly to transform the relations with citizens, businesses, and other government entities. The European Commission's Information Society describes e-government being "for people to be online,

not in line" (Europa, 2001). Reinermann (2001) sees it as "the transformation of public institutions into 'cyberspace' – an area without restrictions caused by space, time or hierarchies".

Some researchers - taking the broad e-government view - provide a composite e-government definition comprising three or four dimensions. For example, Heeks (2001) classifies three dimensions for e-government: electronic service (e-service), electronic administration (e-administration), and electronic society (e-society) (concerned with building society through fostering interactions and partnerships between the government and all constituents of the society). The two dimensions e-service and e-administration are also pointed out by Dawes (2002) and Jansen (2005), and they identify electronic democracy (e-democracy) as a third dimension. Dawes (2002) adds also a fourth dimension: e-commerce, viewed principally as the electronic exchange of money for goods and services.

The researcher concludes that the classification of Jansen (2005) - that provides three e-government dimensions: e-service, e-administration, and e-democracy - is the most indicative since it combines all views of e-government. The examination of the e-society dimension defined by Heeks (2001) indicates that it has the same meaning as e-democracy; as of the fourth dimension – e-commerce – stated by Dawes (2002), it can be considered as part of e-services. Table 2.1 shows these dimensions and their meanings.

Dimension	Meaning
E-service	Comprises the delivery of all types of electronic services (Centre for Technology in Government, 2001; Dawes, 2002; E-Europe, 2005; Fang, 2002; Grönlund 2000; Heeks, 2001; Kearns and Taylor, 2003; Prins, 2006; Schubert and Hausler, 2001; Turban et al., 2002; Wyld, 2004).
E-administration	Includes various types of management work and internal processes and operations (Centre for Technology in Government, 2001; Chadwick and May, 2003; Dawes, 2002; E-Europe, 2005; Fang, 2002; Grönlund 2000; Heeks, 2001; Janakova, 2004; Koh et al., 2006; Prins, 2006; Schubert and Hausler, 2001; Wimmer, 2002).
E-democracy	Focuses on the political processes and interaction between the constituents and the government (Centre for Technology in Government, 2001; Janakova, 2004; Dawes, 2002; Fang, 2002; Grönlund, 2000; Heeks, 2001; Prins, 2006; Schubert and Hausler, 2001; Wyld, 2004).

Table 2.1 - Dimensions of E-Government

The Classification of e-government into the above three dimensions (e-service, e-democracy, and e-administration) is described by Maio et al. (2002) who define e-government as "the transformation of public-sector internal and external relationships through Internet-enabled operations and information and communication technology to optimise government services delivery, constituency participation and internal government processes". The researcher suggests that such definition reflects to a great extent all e-government aspects and could be a common definition agreed upon by most researchers.

After concluding on an e-government definition, it is also important to place the context of e-administration in relation with e-government types of relationships. Based on the view suggested by different researchers, Hiller and Belanger (2001) classify these relationships into the following: (i) government providing services to citizens (G2IS); (ii) government fostering communication and participation of citizens concerned with the political process (G2IP); (iii) governments facilitating offering online services to business (G2BC); (iv) government facilitating transactions with businesses, such as e-procurement (G2BMKT); (v) governments enabling access to information and services to their employees (G2E); and (vi) governments ensuring collaboration among public agencies (G2G).

Following such categorisation, one could argue that e-administration – which is the main focus of this study - address chiefly the relation between government and employees (G2E) and between public organisations (G2G). The study investigated these two types of e-government, and researched also the relation between government and citizens (G2IS) through getting the feedback of employees and top management about online services provided and means of evaluating citizens' perceptions towards these services in each of the four public organisations investigated.

2.2 Electronic Readiness (e-readiness) measurement models

Assessing E-Government Readiness (EGR) dictated the need to investigate e-readiness assessment approaches: since EGR is a main element of a country's overall e-readiness (Kovacic, 2005). A country's "e-readiness" is essentially "the degree in which a community is qualified to participate in the Networked World. It is measured by judging the relative advance of the most important areas for the adoption of the ICTs and their most important applications" (Budhiraja and Sachdeva, 2002).

GeoSINC International (2002) identifies five main areas of activities that contribute to the overall e-readiness of a country: (i) access and connectivity; (ii) training; education and public awareness; (iii) government leadership; (iv) business and private sector initiatives; and (v) social development that builds up on the result of initiatives taken in other areas but

should also be promoted. After a thorough investigation of 17 e-readiness models, the researcher identifies five key categories of assessment criteria: (i) IT infrastructure, (ii) human resources, (iii) policies and regulations, (iv) environment (economical, political, cultural), and (v) e-government transformation (addressing internal factors affecting e-government such as public websites and ICT usage by government). Table 2.2 lists each category, and the underlying items associated with it.

Area	Content
Information Technology Infrastructure	Usage in terms of type and quality of services available, software and hardware.
Human Resources	General, and in terms of the information technology sector.
Policies and Regulations	Information and communication technology policy in terms of security policy, security standards, legal recognition of digital signature, intellectual property rights (IPR), and protection and privacy policy.
Environment	Economic implications on the information technology sector as well as the political structure, culture, and e-leadership (key players – negotiations)
E-government Transformation	Availability of government websites and public e-service, and use and promotion of ICT in the government.

Table 2.2 – Assessment Criteria for E-Readiness Models

Bridges.org, a non-profit organisation dedicated to research related to ICT is the most entity referred to in the literature that publishes reports compiling the majority of e-readiness models and providing a detailed comparison between them. The most applied e-readiness assessment models are included in the reports issued by Bridges.org in 2001 and 2005. Table 2.3 shows a comparative analysis between these models presenting the main components measured by each model according to the classification presented in table 2.2.

Model	IT Infrastructure	HR	Policies and Regulations	Environment	E-government Transformation
Center for International Development – Harvard University and IBM (CID)	√	√	√	√	○ Government effectiveness in promoting the use of ICT ○ Availability of online government services ○ Extent of government websites ○ Business Internet interactions with government
Center for International Development and Conflict Management (CIDCM)	√	√	√	√	
International Telecommunication Union (ITU)	√				
The World Information Technology and Services Alliance (WITSA)	√	√	√	√	
U.S. Agency for	√	√	√	√	○ ICT usage in government

International Development (USAID)					(hardware, software, and networks in each ministry)
World Bank (Knowledge Assessment Methodology - KAM)	√	√		√	○ Availability of online government services
World Economic Forum, Infodev & INSEAD (Network Readiness Index - NRI)	√	√	√	√	○ Government use of ICT for its own services & processes ○ Volume of transactions that businesses have with governments ○ Availability of online government services

Table 2.3 – Comparative Analysis between E-Readiness Models

The analysis presented in table 2.3 indicates that some e-readiness models, such as CIDCM, ITU, and WITSA do not include e-government in their assessments. The other tools (CID, KAM, NRI, and USAID) do not consider all internal factors affecting EGR; they only assess availability and number of online services, and promotion and usage of ICT by the public sector. The same conclusion can be applied on additional tools included in e-readiness literature. Appendix A provides a full listing of these additional tools.

Since e-government is only a component of e-readiness, e-readiness assessment models do not undertake an in-depth research of e-government; they ignore vital elements, such as culture and technology acceptance of public officials (Dada, 2006), quality of ICT in government, strategic alignment, etc. In addition, e-readiness indicators are over-simplified measurements not reflecting a veritable e-government status, omitting more relevant dimensions difficult to be measured (Bannister, 2004). Most importantly, in studying e-government in Latin America, Altman (2002) concludes that there is no direct relation between e-readiness and e-government implementation in a country; this clarifies Jansen's (2005) recommendation to focus on the most particular factors to e-government when attempting to measure it. Based on the analysis presented, the study confirmed the inadequacy of e-readiness models for assessing EGR, which necessitated the investigation of models developed specifically for this purpose.

There are still some factors derived from e-readiness assessments that can affect EGR such as the availability of online services, the extent of ICT usage in public organisations and efficiency of ways of promoting it, and the degree of communication between citizens and government through public websites.

2.3 E-Government Readiness (EGR) Assessment Models

Early publications on EGR assessments appeared around 2000 (Hu et al, 2005) (e.g., the first Accenture report issued in 2000 (Accenture, 2005), and the first Darrell West's assessment at Brown University published in 2001 (West, 2006)). Since then and until

nowadays, Bannister (2007) states that "at least three e-government benchmarks have been published each year as well as a regular stream of one-off measurements". Such assessments propose basic assessment criteria, conceptualising e-government development and implementation (Jansen, 2005). Table 2.4 presents several EGR models, the corresponding regions or countries measured, and the measurement criteria used by each model.

Framework	Countries/Regions	Measurement Criteria
Accenture (2005)	22 countries	○ Service maturity (breadth, depth) ○ Customer service maturity (citizen-centred interactions, cross-government service interactions, multi-channel service delivery, proactive communication and education)
Accenture (2007)	22 countries	○ Service maturity (breadth, depth) ○ Customer service maturity (citizen-centred interactions, cross-government service interactions, multi-channel service delivery, proactive communication and education) ○ Citizen voice
Bertelsmann Foundation (2002)	12 case studies from developed countries (e-government portals belonging to governments, regions and local authorities)	○ Benefit (quality and quantity of e-services) ○ E-participation ○ E-transparency ○ Change management ○ Efficiency (IT architecture and infrastructure, resource planning, human resources)
Commonwealth Centre for Electronic Governance (2002)	5 developed countries	○ Public access and usage of broadband connectivity ○ Citizens' access of e-services ○ Readiness of a public key infrastructure (PKI)
Koh and Prybutok (2003)	City of Denton, Texas	○ Internal and external e-government functions in 3 categories: informational, transactional, operational) ○ E-services transformation at 3 levels: strategic, system, data
UNDESA (2003b, 2004, 2005, 2008)	179 UN country members	○ Web presence ○ Telecommunication infrastructure ○ Human capital
Cap Gemini Ernst and Young (2003, 2004, 2006)	18, 28, 28 European countries	○ Quality and usage of public e-services
WASEDA University (2006) - Japan	32 Countries	○ IT infrastructure ○ Online systems and applications ○ Management optimisation (enterprise architecture, ICT investment, system optimisation, integrated network system, administrative and budgetary systems, public management reform by ICT) ○ Homepage features

		○ Chief Information Officer (CIO) related aspects ○ Promotion of e-government (priority of planning and strategy, promotion activities, legal framework, evaluation system)
West (2006, 2007, 2008) - Brown University	Websites in 198 countries	○ Features of government websites

Table 2.4 – Comparative Analysis between EGR Models

The analysis of the above models reveals that they do not cover all dimensions and aspects of EGR. Most of them focus on one dimension of e-government: e-services, evaluating services offered by governmental websites (West, 2006, 2007, 2008; UNDESA, 2003b, 2004, 2005, 2008; Cap Gemini Ernst and Young, 2003, 2004, 2006). Such evaluation based on only measuring the front of public websites is a too narrow view on e-government (Peters et al., 2004) and cannot be considered a sufficient approach to assess EGR. UNDESA (2003b, 2004, 2005, 2008) reports go further to evaluate the telecommunication infrastructure and the human capital. The telecommunication infrastructure is also measured by the Commonwealth Centre for Electronic Governance (2002) but limited only to the availability and usage of broadband connection. In addition, the Commonwealth Centre for Electronic Governance (2002) considers in his criteria the existence of a public key infrastructure to ensure the security of interactions with government websites. The Bertelsmann Foundation benchmarking (2002) investigates both e-democracy and e-administration dimensions, but is limited only to the efficiency and change management behind the e-services provided by the case studies investigated. Finally, besides evaluating a country's ICT infrastructure and online applications, WASEDA University (2006) addresses important issues related to the back office related to strategic management, e-government promotion, presence of a Chief Information Officer (CIO), and homepage characteristics; but does not cover all issues related to e-administration.

Accenture - a consulting, technology services and outsourcing company - publishes a yearly e-government evaluation since 2000 (Accenture, 2005), but stresses mainly on the concept of treating citizens as customers from the part of public institutions. This study focuses on the reports of the last three years to discuss Accenture's most advanced research. In 2005, the company ranks 22 countries according to two main criteria: the maturity of the services offered at their national government websites, and the extent to which governments are managing and maintaining relationship with their customers. In 2006, Accenture did not conduct a country's ranking and decided to perform an in-depth qualitative research through conducting interviews with e-government policy makers. In its 2007 report, Accenture (2007) adds to the previous criteria a third component that

considers the citizens' feedback in the same countries studied to understand their perception towards the services offered to them. In addition, Accenture (2007) reports real-life lessons from 52 senior government executives in 17 of the 22 countries selected in the ranking. Eventually such additional qualitative data aids in understanding e-government success factors and in identifying the best practices from these different countries.

As seen from the presentation of all EGR assessments discussed above (table 2.4) that while much research focuses on the front-office and the use of e-services by citizens and businesses, it seems that there is less attention to the streamlining of back office operations (Homburg and Bekkers, 2002) prescribing how governments need to reorganise to meet the challenges and opportunities represented by ICT. This is not surprising, as almost exactly the same conclusion has been drawn from the first phase of the "dot.com" wave in which enterprises went on Internet without changing their internal business organisation (Jansen, 2005).

To summarise, all EGR models presented in table 2.4 cannot be used to assess EGR of a public organisation:

1. They are all result-oriented, focusing mainly on quantifiable results and seldom addressing several unquantifiable but important factors of e-government. Although Accenture (2006, 2007) includes important qualitative information, it is mainly centred on customer service and is not considered in the evaluation criteria. In addition, Bannister (2007) poses reservations about the Accenture reports as being driven by marketing objectives concentrating on commercial interests to the company.

2. They are one-sided (citizen-centred), and emphasise the promotion of the e-service dimension, appraising only the websites to facilitate quantification, which makes the appraisal of e-government inaccurate.

3. They do not concentrate on factors directly related to e-government. They rather investigate external ones such as IT infrastructure, and human capital which, whilst important, are already addressed in e-readiness assessments.

4. The examination of the three EGR assessments that approach the e-administration dimension: Koh and Prybutok (2003), the Bertelsmann Foundation (2002), and WASEDA University (2006) revealed that the first two limit their assessment on developed countries without verifying their applicability on developing countries.

Moreover, when assessing e-government back office management, they do not address all aspects affecting EGR. WASEDA University (2006) is also no exception; the people dimension related to employees working in the public sector is not fully investigated. Such assessment simply considers the position of a Chief Information Officer (CIO) without investigating the competency of other employees using computers in public organisations. In addition, WASEDA University (2006) does not approach many factors related to the technology dimension such as the quality of information, software applications, and hardware devices. Furthermore, WASEDA University (2006) does not explain the rationale behind the selected criteria to clarify the theoretical foundation upon which these measuring criteria are employed.

Only in its latest report, UNDESA (2008) recognised the importance of back office assessment through providing a chapter in its report that contains several issues crucial to back office in public organisations. The end of the chapter includes these issues in the form of a checklist to help policy makers check their availability in their organisations. Certainly, this chapter represents a remarkable progress in recognising the value of back office management, yet it does not provide answers to several questions such as, can these issues be categorised into different dimensions? What is their interrelationship? Do they all have equal weights in affecting the government back office?

5. Except for Koh and Prybutok (2003), these models approach e-government in a macro or national level, rather than in a micro one, i.e. over an organisation (Hu et al, 2005).

6. Finally, these models are assessed relying on one or more of three methodologies: 1) secondary data; 2) citizens' feedback; or 3) policy makers of e-government projects. Except for the model developed by Koh and Prybutok (2003), the other models do not investigate EGR from the perspective of government employees; how they perceive e-government, and to what extent they are aware of all aspects related to the viability of e-government projects. This group could be the best candidate to identify the most important factors affecting EGR since civil employees are one of the major project's stakeholders and are aware of most of the organisation's functions and activities. Additionally, it is very important to investigate the extent of communication between government employees and e-government policy makers and the degree of the employees' involvement in public organisations.

After discussing e-readiness and EGR models and demonstrating that they cannot be the perfect mean to assess EGR within a public organisation, it became essential to investigate IS appraisal models because e-government is mainly an application of ICT. Thus, researching such models aimed to verify the existence of an assessment to be employed in realising the objective of this study.

2.4 Information Systems (IS) success models

Publications in assessing IS success started in the late seventies (e.g., King and Rodriguez 1978; Matlin, 1979; Rolefson, 1978). One of the most widely cited models is the DeLone and McLean (1992) IS success model (Heo and Han 2003; Myers et al., 1998), referenced by over 150 articles (DeLone and McLean, 2002).

In their model, DeLone and McLean (1992) argue that IS success is a dependent variable affected by six independent and interrelated dimensions or constructs. These variables are: system quality, information quality, use, user satisfaction, individual impact, and organisational impact. The following lines explain briefly each construct as stated by the study:

- System quality: refers to the contribution of information processing system. Some of its measures are: convenience of access, flexibility of system, integration of systems, response time, realisation of user expectations, reliability, ease of use, ease of learning, perceived usefulness, etc.

- Information quality: concerning the quality of information produced by the system. This can be measured by accuracy, timeliness, reliability, completeness, conciseness, relevance, understandability, etc.

- Use: defined as the user utilisation of the output of an IS. Some of its measures are: use or non use of different systems, frequency of use, motivation to use, etc.

- User satisfaction: presenting recipient reaction to the output of an IS. Main construct measures are: difference between information needed and information received, user complaints regarding information centre services, user satisfaction concerning different facets of the IS, etc.

- Individual impact: refers to the effect of information on the recipient's behaviour. Major measurements include: user confidence, efficient decisions, quality of decision analysis, quality of career plans, cost awareness, etc.

- Organisational impact: defined as the effect of information on organisational performance. Some of this construct's measures are: profitability, cost reduction, production scheduling costs, market share, etc.

The model states that system quality and information quality (independently and jointly) have an effect on use and user satisfaction. In addition, both use and user satisfaction have an effect on each other; and they lead to an impact on individuals. Finally, such impact on individual performance should have some impact on organisation. The authors recommend that the model should be tested, and that the selection of measures for each construct should be based on each research context. Figure 2.1 shows the model expressing the relationships between its different constructs.

DeLone and McLean's (1992) model is an important contribution to the literature on IS Success measurement because it is the first study that tries to impose some order on IS researchers' choices of success measures. Since the model was developed, a number of studies were conducted to test and validate it (Seddon and Kiew, 1996; Fraser and Salter, 1995; Rai et al., 2002).

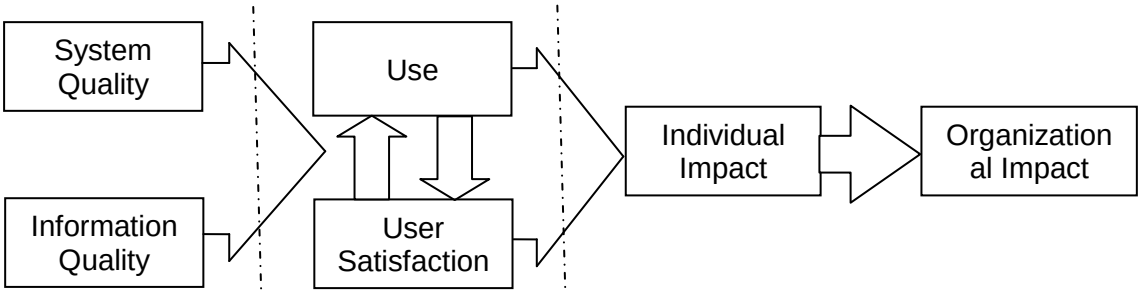


Figure 2.1 - Information System Success (DeLone and McLean, 1992)

Many researchers use the model as a foundation for suggesting modified frameworks for assessing information systems. For example, Pitt et al. (1995) argue that an IS assessment should not focus only on the quality of the product but should also consider the quality of the service. They highlight the role of the IS department in an organisation as a provider of both products and services. As a result, they include service quality as an additional construct to information quality and system quality. This view is supported by other researchers confirming the importance of including service quality measure as a part of IS success (Kettinger et al., 1997; Li, 1997; Wilkin and Hewett, 1999; Wilkin and Castleman, 2003). Moreover, Wilkin and Hewett (1999) stress on the importance of evaluating the quality of service as expected and perceived by different stakeholders.

Seddon (1997) criticises DeLone and McLean's (1992) model arguing that it is confusing because it combines two sorts of models: (i) variance models (based on causal

relationship from the part of an independent variable on a dependent one, without the interference of other variables); and (ii) process models (based on the necessity of the existence of all events in a certain sequence, to cause a certain outcome). Variance and process models have different meanings leading to different interpretations of the same framework. He also presents three different meanings underpinning the use construct which are: (i) benefits from use; (ii) beginning of a process that leads to user satisfaction, individual impact, and organisational impact; or (iii) future use. For this latter meaning, Seddon (1997) confirms that use in this case is a behaviour and should not be considered as a measure or indicator of IS success. To overcome the limitations of DeLone and McLean's (1992) model, he suggests a re-specified model through adding the following constructs: expectations about the net benefits of future IS use, consequences of IS use, perceived usefulness and net benefits of IS use to society. Although the framework highlights essential points in measuring IS success, it is not tested empirically to prove its validity.

Aiming to examine and learn from all contributions and re-specifications undertaken on their framework proposed in 1992, DeLone and McLean (2002) present a reformulated IS success model (see figure 2.2). The new model adds one more dimension to quality: service quality, since the progress that occurred in IS environment triggered the creation of end-user computing enabling IS organisations to be service providers as well as information providers. To avoid the different interpretations of the use construct, the model replaces use by intension to use, which describes an attitude in the case of IS voluntary use. Also, individual impact and organisational impact are replaced by only one construct: net benefits, to ensure that the net impacts or outcomes are positive. Net benefits combine the positive IS impact on different stakeholders. This is due to the fact that IS impact has developed to affect several stakeholders other than the direct user only. Other IS impacts could be workgroup impacts (Myers et al., 1998), societal impacts (Seddon, 1997), and consumer impacts (Hitt and Brynjolfsson, 1994; Brynjolfsson, 1996). The model does not specify the different impacts because it argues that such impacts depend on specific research contexts. Finally, the model assumes that if net benefits occur, this will eventually lead to further increase in both constructs: intension to use, and user satisfaction.

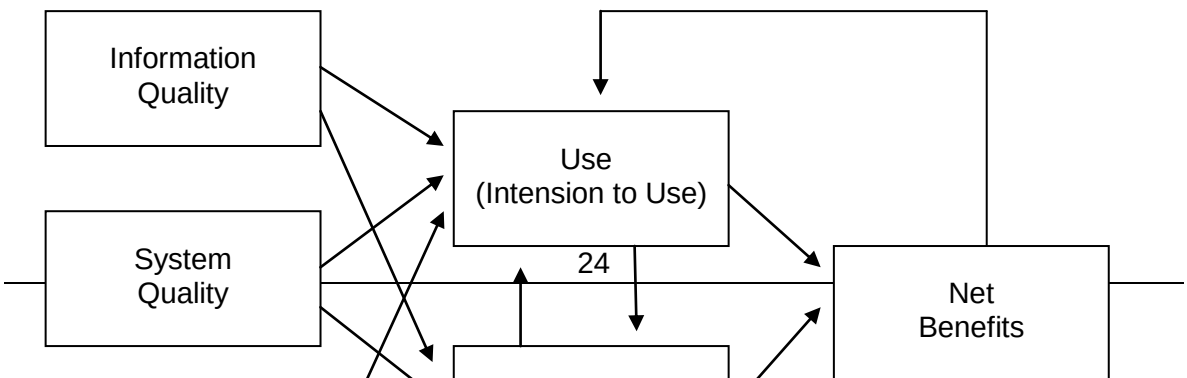


Figure 2.2 – The Reformulated IS Success (DeLone and McLean, 2002)

In an attempt to apply DeLone and McLean (1992) model in assessing e-government in Australia, Guo and LU (2005) claim that the existence of a website providing a communication channel between citizens and governments is vital in the case of e-government. Accordingly, they argue that when investigating IS quality, the new construct, web presence quality, should be added to the original two: information quality and system quality.

After reviewing the above IS assessment models, the study concluded that the criteria selected to assess IS success are classified into three categories: (i) quality: of information, system, service, and organisation's website; (ii) stakeholders' perceptions and expectations of the information system; and (iii) benefits realised from using the system. Attempting to apply these categories on the context of this research (that argues that an EGR framework comprises the four building blocks (or dimensions): (i) strategy, (ii) processes, (iii) technology, and (iv) people), the researcher determined that constructs under each category should be included in the proposed EGR framework. For example, the first category related to the quality of information, system, service and the website was included under the technology dimension. As for the second category related to the perception and expectations of stakeholders as well as the third category concerned with the benefits reaped (or to be reaped) from e-government implementation, the researcher considered them in the proposed framework in more than one dimension. Such issues should be taken into account by top management when setting an e-government strategy, and should be usually evaluated. In addition, it is important to investigate these issues from the employees' point of view to understand the way they perceive e-government and whether it has a positive impact on their working practice.

Evidently the above three assessment categories are essential in evaluating an information system, but are not sufficient because IS should be viewed as a multifaceted socio-technical issue (Klein and Hirschheim, 1987; Orlikowski, 1992; Walsham, 1993),

focusing on the interaction between social and technical aspects (Morton and Rockart, 1984; King and Kraemer, 1986; Symons, 1990), and affected by the organisational environment as well as the people involved (Serafeimidis and Smithson, 2000).

This approach is more applicable in considering e-government as a strategic information system (SIS) (Koh and Prybutok, 2002) since it has the ability to transform internal and external relationships of government. Many researchers believe that SIS should not be narrowed to IS domain only, but should also be regarded, managed, and evaluated as an organisational issue (Henderson et al., 1987; Hufnagel, 1987; Segars and Grover 1998).

This conforms with what Heeks (2003) views as e-government aspects in his ITPOSMO model measuring Information, Technology, Processes, Objectives and values, Staffing and skills, Management systems and structures, and Other resources such as, time and money. Such dimensions are not yet captured entirely in one framework.

Following the discussion above, IS models consider critical factors to EGR related to the quality of technologies, stakeholders' expectations, and benefits realised from IS implementation. It could also be argued that IS models do not cover entirely all aspects affecting EGR of public organisations especially those related to organisational environment such as business processes, human resources, strategic management, etc. This led to further research of a related field in the literature concerning the models that assess e-commerce systems because beside being considered an IS system, e-government is seen an e-commerce system and though it was important to undertake a review of the literature in such domain to investigate the suitability of e-commerce assessment models in assessing EGR, and to highlight the common aspects included in the evaluation of such models.

2.5 Electronic Commerce (e-commerce) success models

DeLone and McLean model is used as a theoretical foundation in a number of studies attempting to measure e-commerce success (e.g., Loiacono et al., 2000, 2002; Palmer, 2002; Barnes and Vidgen, 2002, 2003; Liu and Arnett, 2000; Huizingh, 2000). These studies view that this model is effective due to two reasons: first, since an e-commerce system can be considered as a type of information system (Molla and Licker, 2001), IS success models can be applicable when investigating e-commerce success; and second, the model is used and tested intensively in IS literature.

Molla and Licker (2001) extend DeLone and McLean's (1992) model to cover all functions and aspects related particularly to e-commerce such as, marketing phases: pre, during,

and after sales, and e-commerce different objectives in providing information, transactions, or services. In their suggested framework, Molla and Licker (2001) replace user satisfaction by customer e-commerce system satisfaction and consider it an independent variable to e-commerce success. Also, system quality is substituted by e-commerce system quality, and information quality by content quality.

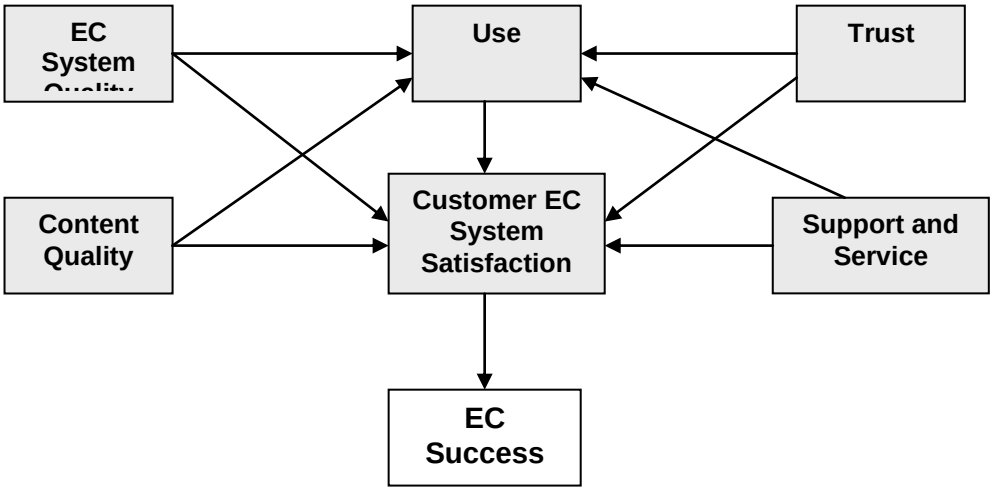


Figure 2.3 - E-Commerce Success Model (Molla and Licker, 2001)

The model does not include organisational impact since e-commerce users are not commonly part of the organisation. Two other independent variables are added: trust, and support and services, which both have an effect on use and on customer e-commerce satisfaction. Figure 2.3 shows the model indicating its different constructs and the relations between them. The proposed model cannot be generalised in assessing e-commerce success since it is limited to only one facet of e-commerce targeting customers who use the World Wide Web. Moreover, it requires further research to be validated and tested empirically.

Following a literature review specifically on e-commerce assessments, the study revealed that researchers have not yet agreed on a standard framework, but the six main constructs identified in most studies are: (i) design, (ii) ease of use, (iii) system quality, (iv) information quality, (v) service quality, and (vi) security and privacy. Table 2.5 shows each dimension along with the study that uses it.

Construct	Description	Sources

1) Design	Aesthetics and navigational system of the website	Barnes and Vidgen, 2002, 2003; Palmer, 2002; Yoo and Donthu, 2001; Liu and Arnett, 2000; Loiacono et al., 2000, 2002; Turban and Gehrke, 2000; Farquhar et al., 1998
2) Ease of Use	The ability to use and interact with the website without effort	Parasuraman et al., 2005; Barnes and Vidgen, 2002, 2003; Palmer, 2002; Schubert and Dettling, 2002; Yoo and Donthu, 2001; Elliot et al., 2000; Loiacono et al., 2000, 2002; Henneman, 1999; Nielsen, 1999; Farquhar et al., 1998;
3) System Quality	Reliability, page loading speed, availability, etc. of the website	Cao et al., 2005; Parasuraman et al., 2005; Palmer, 2002; Molla and Licker, 2001; Yoo and Donthu, 2001; Han and Noh, 2000; Turban and Gehrke, 2000; Kim, 1999; Loiacono and Taylor, 1999; Von Dran et al., 1999; Farquhar et al., 1998
4) Information Quality	Quality of information and of its presentation on the website	Cao et al., 2005; Barnes and Vidgen, 2002, 2003; Palmer, 2002; Molla and Licker, 2001; Elliot et al., 2000; Liu and Arnett, 2000; Loiacono et al., 2000, 2002; Turban and Gehrke, 2000; Farquhar et al., 1998
5) Service Quality	Support provided to users of the website to assist them throughout their interaction with the website	Cao et al., 2005; Barnes and Vidgen, 2002, 2003; Palmer, 2002; Molla and Licker, 2001; Elliot et al., 2000; Huizingh, 2000; Liu and Arnett, 2000; Loiacono et al., 2000, 2002; Farquhar et al., 1998
6) Security and Privacy	Security in performing transactions and in protecting the personal information of users.	Parasuraman et al., 2005; Barnes and Vidgen, 2002, 2003; Schubert and Dettling, 2002; Molla and Licker, 2001; Yoo and Donthu, 2001; Han and Noh,

		2000; Loiacono et al., 2000, 2002; Turban and Gehrke, 2000; Farquhar et al., 1998

Table 2.5 - Main Constructs used in E-Commerce Success Research

The assessment criteria presented in table 2.5 were included in the proposed framework of this research due to their importance in evaluating the success of an e-commerce system. While the studies that developed such criteria were tested on university students as a sample representing users of websites (which do not represent the users of the websites (Parasuraman et al., 2005)), this research used a sample of employees using computers in their work representing employees working in the public sector. Certainly governmental websites are targeted mainly to be used by citizens seeking services from their corresponding organisations, but since a large part of the assessment criteria is related to the internal factors that exist in public organisations, and that website quality constitutes a small part of such evaluation, employees are the most suitable subjects to provide valuable contribution. Furthermore, since they are aware of the work life cycle and a large percentage of them interact with citizens, they should visit the website continuously to verify its compatibility with the work life cycle, and with requirements of the variety of citizens they serve as part of their jobs.

Researchers criticise most studies assessing e-commerce success because they do not cover all facets of service quality (especially order fulfilment). Although Barnes and Vidgen (2002) admit that a large percentage of the selected sample have committed purchases, Parasuraman et al. (2005) note that the questionnaire to be filled does not investigate their experience in order fulfilment in dealing with the bookstores' websites. This gap is filled in the recent studies only (Fassnacht and Koese, 2006; Parasuraman et al., 2005; Wolfinbarger and Gilly, 2003). For example, Parasuraman et al. (2005) include fulfilment as a dimension in their developed E-S-QUALScale. They also define E-RecS-QUAL, a subscale of E-S-QUALScale that measures the recovery service provided through Websites whenever consumers encounter any problem. Aiming to cover all aspects of service quality, Fassnacht and Koese (2006) develop a conceptual model encompassing all aspects of electronic services. Their model includes three dimensions: (i) service environment, concerned with the physical appearance of the services; (ii) service delivery, related to the interaction process between the company and the consumers; and (iii) service product, focusing on the result of the service exchange. Since this research gathered data mainly from employees working in public organisations and not citizens, the first two dimensions: service environment and service delivery can be evaluated by

employees. As for the third dimension related to service delivery, it was not considered in the research framework.

Reviewing the studies that developed the assessment criteria presented in table 2.5 revealed that such studies limited the evaluation of website quality only in a business-to-consumer model concerned with online shopping activity. There may be further assessment criteria in other contexts. For example, Huizingh (2000) includes business-to-business websites as well, and argues that selling online is not the only purpose behind implementing an e-commerce solution. His model (see figure 2.4) investigates several aspects related to the organisation that transforms to e-commerce such as, characteristics of the company, drivers and purposes of implementing a website (web initiative), features of the website (website characteristics), and ways to promote the website and to align its promotion with the organisation's marketing plan obtaining the required support throughout the organisation (web strategy). It was therefore important to include these aspects in the research framework of this study because, if considered while formulating an e-government strategy, such aspects will definitely contribute to the success of e-government in any public organisation.

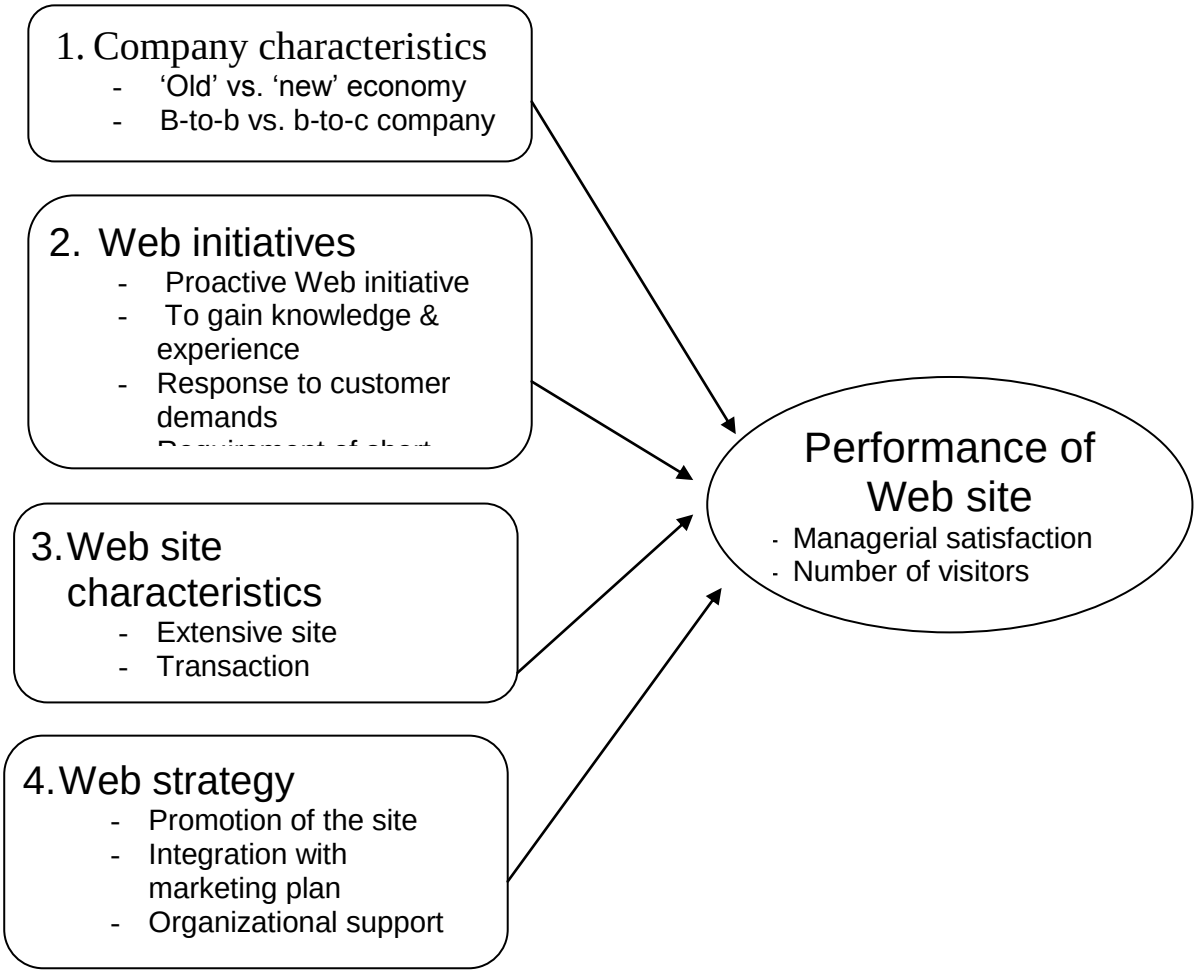


Figure 2.4 - Website Performance Framework (Huizingh, 2000)

Although Huizingh (2000) addresses more aspects than website quality, they are only directed towards the website investigating: company characteristics that could have an effect on web presence, motives and objectives of implementing an e-commerce solution, and means to be adopted to market it. This led to an important question:

> Is it sufficient to evaluate e-commerce success by relying on web presence only?

In order to answer this question, further research was conducted on the meaning of e-commerce as viewed by researchers. Zwass (1996) defines e-commerce as "the sharing of business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks." He states that e-commerce is not limited only to buying and selling goods, but includes also the various processes that support the website activities within each organisation. The same view is supported by Applegate et al. (1996) who see that e-commerce involves using ICT to perform several activities throughout the value chain both inside and outside the organisation. This is due to the fact that companies nowadays base their strategy on intensive information that necessitates its collection and processing among customers, suppliers, and within the company itself (Glazer, 1993). Kalakota and Whinston (1997) classify e-commerce applications into three different categories: inter-organisational (business-to-business), intra-organisational (within a business), and consumer-oriented (customer-to-business).

Riggins and Rhee (1998) propose a framework - the e-commerce domain matrix - that defines four types of e-commerce applications based on two characteristics: the location to the application inside or outside the system firewall, and the type of relationship expressing the role of IT either in enhancing existing relationships or creating new ones that were not possible without IT existence. Figure 2.5 demonstrates this framework indicating the four types of e-commerce classified upon the two characteristics: location and type of relationship.

Seybold (1998) points out that redesigning business processes is a crucial factor in realising successful e-commerce strategies and in evaluating the quality of electronic services (Fassnacht and Koese, 2006). Despite the importance of internal activities in organisations as expressed by researchers, such activities are always ignored (Elliot et al., 2000) since integration of Internet activities with the back office operations and with

traditional information systems constitutes a security threat, and requires high budget allocation (Schubert and Dettling, 2002).

Based on the above views, the study confirmed that measuring e-commerce success dictates investigating internal issues related to the organisation that implements an e-commerce solution. Such issues are not considered in the discussed e-commerce success models. Nonetheless, there are critical success factors in these models that can be applicable on EGR.

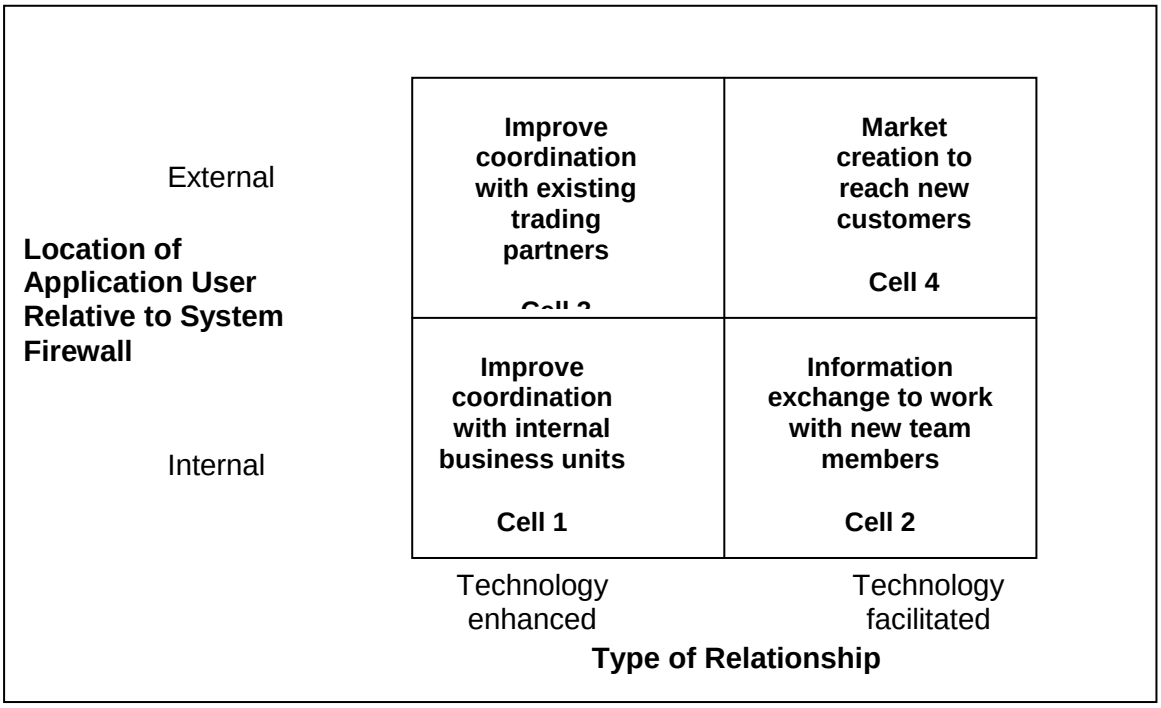


Figure 2.5 - Electronic Commerce Domain Matrix (Riggins and Rhee, 1998)

Reviewing e-commerce success models available in the literature revealed that no model could be entirely adopted to assess EGR of a public organisation because they focus mainly on website evaluation or the activities directly related with it. Such models do not consider all critical success factors related to the internal activities in a public organisation such as business processes, identification of challenges, leadership and top management support, skills of employees using ICT, etc. Even so, literature in this area of research provided a valuable contribution in the development of the research framework since it highlighted a number of issues that should be added to the framework such as the technology aspect related to the quality of the website, the integration between internet activities and the back office, and the strategic role of each organisation's website.

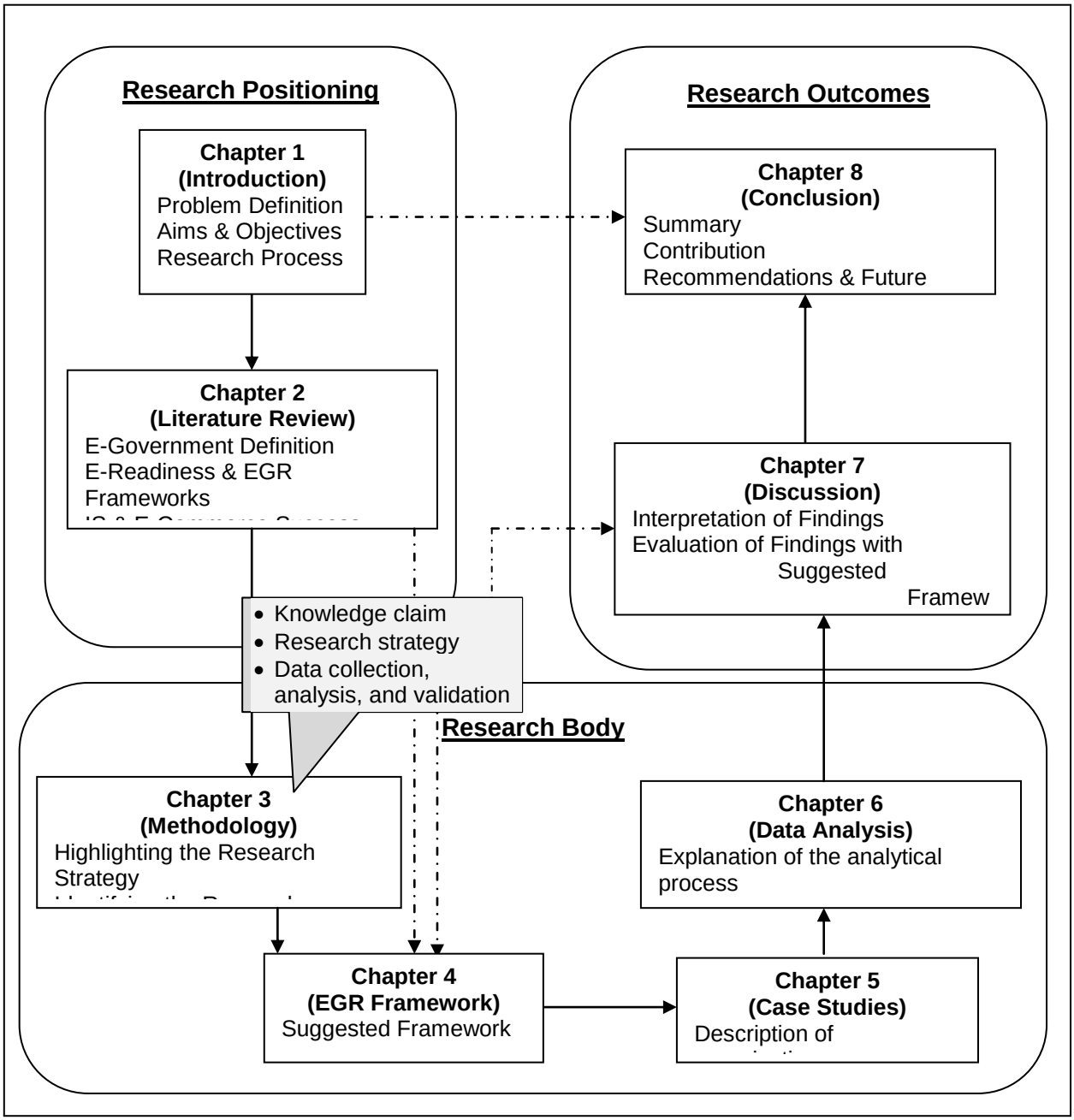
2.6 Summary

Initially, this chapter provided the foundation for this research study and introduced previous work on assessments related to e-government. First, it included an overview of the different meanings of e-government and the e-government definition selected by the researcher that covers all e-governments aspects. The other sections of the chapter presented the different e-readiness and EGR assessments models as well as various models developed to assess information systems and e-commerce. Analysing these assessment tools revealed their inadequacy in assessing EGR of a public organisation. Nonetheless, they can be used as a foundation for developing a framework to perform this assessment. The next chapter will explain the methodology that was followed to reach such objective.

3. Methodology

Objectives of chapter 3

- Present the knowledge claim selected.
- Identify the research strategy embraced.
- Explain the methods followed for data collection, analysis, and validation.



The previous chapter presented a review of the literature relevant to E-Government Readiness (EGR) assessment. Critical analysis of the various measurement models available in the literature revealed the absence of a framework for assessing EGR of a

public organisation. This chapter explains the methodology used starting by a brief presentation of the research design and the procedures for conducting the study (described in chapter 1, section 1.3). Next, the chapter investigates the knowledge claim relevant to the research design, which paves the way to selecting a research strategy that could best fit this study. The chapter presents then the research methods to be employed under the chosen research strategy explaining the preparation for data collection phase including pilot testing and sampling of the instrument developed for collecting quantitative data. Finally, data collection methods are discussed, followed by an explanation of the analysis of both quantitative and qualitative data, and of the approaches used for data validation.

3.1 Research design

The initial part of the research process (see figure 3.1) comprises an investigation of the literature relevant to the area of research leading to the development of a preliminary EGR framework. This framework was tested through undertaking an empirical research on a number of public organisations in Egypt.

Data gathered and analysed from the empirical research was compared with the framework proposed earlier leading to the development of a final EGR assessment framework of public organisations in Egypt. The last stage in the research design was to highlight the contribution of the thesis to the e-government field, and in filling the research gap mentioned in the beginning.

Figure 3.1 – Overall Research Process

Realising each stage in the research design dictated an investigation of the research methodologies to set a pragmatic approach that provided guidance through the overall research process. Based on Crotty's (1998) framework, Creswell (2002) suggests that the research design can be set based on the following three main issues:

- The epistemology (or knowledge claim) is to be selected by the researcher.
- The research strategy (or strategies) that could be relevant to this knowledge claim.
- The research methods to be adopted for data collection and analysis.

The following sections attempt to provide an answer to the three inquiries stated above.

3.2 Epistemology

Positioning the research philosophy (or epistemology) gains always special interests from the part of researchers because it aids researchers to analyse not only their work but also others work, and ascertains the academic credibility of a research field (Heeks and Bailur, 2007). In order to select the appropriate epistemology, it was important to identify the main paradigm of this research. It was based on the view of Newell et al. (1967) who define computer science as "the study of phenomena related to computers", emphasising

on the importance of collecting observations concerning computational phenomena leading to building theories that explain such phenomena.

Myers and Avison (2002) propose three epistemological categories of research: (i) positivist (and post-positivist), presuming that reality is objectively given and can be expressed through measurable means, mainly concerned with testing hypothesis and with quantifiable measures of variables; (ii) interpretive, assuming that reality can be discovered through interactions, based principally on understanding phenomena and how people's perceptions could be interpreted; and (iii) critical, suggesting that reality is in a continuous shaping by people who have limited capability to change their social and economic status due to various constraints, essentially directed towards criticising and highlighting these conditions or constraints.

Clarke (1992) conceptualises information systems domain into two fields of study: (i) computer science, concerned with software engineering, database management, and applications of software development; and (ii) business clusters of disciplines, addressing systems analysis and organisational behaviour. This view is extended by Clarke (2000) who classifies research traditions in information systems and particularly in e-commerce into three main categories: (i) conventional scientific research (or positivist), proposing hypothesis that should be tested to provide feedback which could guide in formulating a theory; (ii) interpretivist research, assuming that reality can be differently interpreted depending on many factors in addition to the researcher's perspective; and (iii) engineering research, including artifacts, techniques, or both of them. He states that the first two categories are related to the business disciplines field, whereas the third one belongs to the computer science domain. Clarke (2000) stresses on the importance of considering the first category, conventional scientific research, an instrumentalist discipline that investigates the impact of the developed theory on the real world, and points out the significance of the research results with regard to professionals and managers.

Following an in-depth review of the philosophical assumptions stated above, the researcher concluded that positivist was the most appropriate approach in terms of its compatibility with the research process identified in the beginning. Since the research addressed the factors affecting EGR, the weight of each factor as well as the relation that exists between them, there was a need to develop a framework to:

- Conceptualise the suggested ideas: classify the identified factors and combining them in one EGR assessment framework under different categories.

- Identify variables: translate such factors into dependent and independent variables.
- Set hypotheses: pose assumptions about the type of relations between those variables.
- Focus on observable aspects: determine the appropriate parameters for measuring those variables.
- Adopt a testability principle: test the framework's hypotheses through conducting an empirical research in a number of public organisations in Egypt.

This was completely compatible with the description of the positivist approach mentioned by many researchers (Myers and Avison, 2002; Creswell, 2002; Khazanchi and Munkvold, 2003; Clarke, 2000). Positivist research was also selected because it is characterised by its objectivity, generalisation, and the separation of the researcher from the observed (Wilford, 2004) since the researcher is not a part of the research environment, and his role is limited to gather the data that helps him in understand the situation in the case studies researched. This was the main objective of this research because the researcher focus was to collect data about all the internal factors affecting EGR through different sources of data gathering without interfering or attempting to incorporate any changes in the organisations studied. In addition, triangulating the data gathered through several sources minimised the researcher's objectivity since any reality was determined from more than one source. Finally, undertaking the research in different types of public organisations in Egypt allowed for generalisation because the organisations researched represent, to a great extent, public organisations in Egypt.

3.3 Research strategy

Determining the philosophical assumption governing the research led to a subsequent stage that involved the investigation of the most relevant research strategies. Since the positivist approach selected for the study is associated with setting hypotheses and seeking to test them empirically in the research environment, the researcher deduced that two strategies are relevant to this approach that could serve in reaching the research objectives: surveys, and case studies.

Surveys rely on the concept of collecting data from a sample that represents a whole study population, revealing associations and causal effects among several factors (Hakim, 1987). Surveys are widely used due to their many advantages. For example, they provide transparency and accountability (Hakim, 1987). They can also be reused and repeated to

allow for comparison over different groups, times, or places enabling theory testing in an objective manner (Newsted et al., 1998).

Despite the different advantages of surveys, attempting to apply them in this study would not have been appropriate due to the following three reasons:

- Since surveys are associated with large scale research (Denscombe, 2003), this cannot be realised in several situations especially in case of a developing country such as Egypt, where a small number of public agencies provide online services. Even for those realising that constraint, trying to use surveys for data collection would not have been feasible due to the relatively low number of candidates capable of responding; computer users still constitute a very small percentage of employees at any Egyptian public agency (for example, for Montaza District, the first case investigated, computer users constitute 3% of the total number of employees working at the district [130 out of 4200]. Further discussion on the data collection method is provided in the next chapters).
- Surveys do not provide in-depth understanding of context and history of a given computing phenomena (Pinsonneault and Kraemer, 1993). Such understanding is required in a complex topic such as e-government that is affected by a variety of factors. For example, the researcher did not rely only on quantitative data through distributing a questionnaire to the employees working in the organisations studied, but gathered data also through interviewing top management and some of the employees who replied to the questionnaire. The researcher reviewed also several documents related to the organisations studied and had the opportunity to observe the work place. This qualitative data allowed the researcher to obtain a complete picture about the real ICT situation and its role in each organisation. It provided a rich insight into several important issues related to the working environment such as the internal workflow, management style, culture of employees, major challenges, extent of communication and collaboration among employees, etc. Qualitative data gathered helped also in justifying the rationale behind the quantitative data collected from the questionnaire.
- Depending on quantitative data as the sole data gathering method – characterised by its formal and rigid structure - would have not encouraged employees to reveal

their point of views. They usually prefer to express their ideas and opinions in what appears to be a casual setting and avoid any structure tightness.

Since surveys proved to be inadequate for this research based on the three points raised above, case studies research strategy was investigated. Denscombe (2003) and Blonk (2003) characterise case studies by their focus on one or few instances, their ability to highlight important areas of research due to their in-depth study nature, their power in explaining relationships, causes, and processes rather than relying only on outcomes. Denscombe (2003) reveals that the major strength of case studies approach is its ability to allow the researcher to use a variety of methods in collecting data (see also Platt, 1992; Stake, 1995). She also describes the case of investigation to occur in its natural settings and not artificially created for the purpose of the study (which is the case in this research). This view is supported also by Amoroso et al. (1989), who denote that when adopting case studies strategy, the researcher does not have any control over the phenomenon; he focuses on seeking the relation between context and the phenomena of interest.

The features of the case studies approach explained above proved its ability in overcoming the challenges highlighted in the surveys approach. Focusing on a limited number of instances solved the problem of the small number of public agencies providing online services. In addition, the flexibility of case studies strategy (Hakim, 1987) enriches the research by providing in-depth study through using multiple methods for collecting data; this solved the rest of the problems mentioned earlier associated with surveys.

To further ensure the appropriateness of adopting case studies strategy, a review was performed on all the characteristics of case studies as identified by Benbasat et al. (1987). Based on prior studies of Benbasat (1984), Bonoma (1983), Kaplan (1985), and Stone (1978), Benbasat et al. (1987) summarise case studies characteristics into eleven items. Comparing these characteristics with this research context provided additional confirmation in selecting this approach. Furthermore, Darke et al. (1998) affirm that case study research is “well suited to understanding the interactions between information technology-related innovations and organisational contexts”; this conforms completely to the nature of this study. Case studies strategy fitted also with the study objectives because it defines theoretical constructs, tests them empirically (Lee, 1989), and allows for replication to seek generalisation of findings (Yin, 2002).

Finally, comparing the study objectives with the research design of case studies as identified by Yin (2002) revealed that they matched to a great extent. For example, Yin (2002) highlights the importance of theory development by reviewing the relevant

literature to the research topic, which leads to the development of a proposed theory. This procedure was reflected in the objectives of the study that attempted to: (i) identify all factors affecting EGR through reviewing the relevant literature; and (ii) build accordingly an assessment framework that captures those factors and proposes relations between them. Yin (2002) also suggests that empirical testing allows for comparison with the proposed theory, and then leads to theory development. To reach an analytic generalisation, Yin (2002) recommends that findings obtained from multiple case studies should be compared. Generalisation could then be reached if such findings confirm the same theory. This process was followed to realise the objective concerned with empirically testing the proposed framework through collecting data from several case studies of Egyptian governmental agencies to generalise findings over the entire country.

3.4 Desk research method

A thorough research was undertaken on main assessment models of e-readiness, EGR, information systems, and e-commerce. Such research helped in identifying all critical success factors for EGR. Analysis of such factors revealed that they can be classified into two main categories: internal (specific to each organisation such as different aspects of its strategy, its technical situation, employees' skills, etc.) and external (related to the whole country such as, economical, political, regulatory, etc.).

Although external factors such as environment, IT infrastructure, regulations, etc. are proved to be important in assessing EGR, they were not investigated in this research. The emphasis of this research was on the internal factors that exist within a public organisation because: (i) previous studies in e-readiness and EGR had already addressed them from different perspectives (see chapter 2, sections 2.2 and 2.3 for a complete analysis of these studies); (ii) since external factors have the same effect on all public organisations in Egypt, the researcher decided to focus on studying internal factors to study their varying effect from an organisation to another. The aim was to understand how under the same circumstances (i.e. external factors), different internal factors - such as management styles, employees skills and cultures, business processes, etc. – are capable of changing the degree of EGR and of e-government success in different organisations; (iii) the researcher decided to undertake an in-depth analysis of all internal factors, which contains a rather large number of measures (measuring constructs of all internal factors are listed in chapter 4). Adding external factors would have presented a cumbersome and complicated framework for those interested in such assessment, shifting the attention from the internal factors that were the main concern of the study.

Based on the classification of Baum and Maio (2000), the researcher categorised internal factors affecting EGR into four dimensions: strategy, processes, technology, and people. The researcher believes that such dimensions are the four pillars of the success of any information system, and e-government is no exception. A number of measuring constructs under each dimension - derived from the literature - were also determined. A preliminary framework was then developed suggesting relationships between these different dimensions. Such framework would provide a systematic approach to assess EGR of public organisations because: (i) it measures the effect of each of the four dimensions on EGR according to a number of different constructs under each dimension; and (ii) it highlights the constructs that have the highest effect on each dimension. A questionnaire instrument was then developed reflecting each measuring construct in the framework (the questionnaire structure is explained in section 3.6.1). The aim of the questionnaire was to test the hypotheses in the proposed framework through distributing it to employees working in the public organisations selected as case studies. Chapter 4 presents a full explanation of the different parts of the framework, and denotes the link between each question in the questionnaire instrument and its correspondent construct in the suggested EGR framework.

3.5 Preparation for data collection

According to Yin (2002), it is recommended to undergo a stage of preparation prior to the data collection procedure. During this stage, the required skills of the investigator are identified and appropriate training is provided to him accordingly. Other activities take place also in this stage such as, developing a case study protocol, deciding on the cases to be investigated, and conducting a pilot case study.

The preparation stage was very important in this study because it facilitated the research logistics and contributed to a great extent in smoothing the data collection phase. The well-organised preparation phase - undertaken prior to collecting data from the organisations studied - ensured the appropriateness of data collection without the need to repeat this phase; it is very difficult to receive management approval in public organisations to repeat the data collection process.

In the beginning of this stage, the researcher undertook an in-depth review of literature concerning investigation skills and recommendation of ways for skills' improvements. Investigator skills include acquiring approaches for knowledge elicitation, inquiring about the culture of the cases to be selected, reading a number of case studies research similar to this study, attending training sessions, etc. Next, the researcher developed a case study protocol that represented a roadmap to ensure guidance throughout the whole data

collection process. In this protocol, a summary of the research was provided to inform any reader about its background and objectives. In addition, the protocol contained several data collection procedures such as, identification of means to get access to public organisations (which entities or individuals would be willing to allow for case investigation), determination of the required resources (questionnaire papers, personal computer, provision of incentives for the employees who respond to the questionnaire, etc.), provision of a schedule for data collection (how many visits are needed, and how long each visit takes), and consideration of alternative solution in case of a schedule deviation. The protocol included also the questions to be used, and the relevance of each question to the research objectives. In preparing the questions, a number of studies concerning EGR were investigated to look for the questions or other sources of evidence employed.

The research summary presented to management of each organisation facilitated and expedited top management approval because it provided them with a brief insight into the core of the research, and answered any inquiries they had. As for the organisations willing to be a part of this research, the researcher received an immediate approval of management in three of the four organisations studied; on the contrary, the management were interested in undertaking such assessment and to review the findings and analysis. As for the fourth organisation, Public Hospital (PH) - requested to be anonymous by the hospital's management – management were reluctant in approving such research and replied after 45 days. The schedule set for data collection was not always met due to uncontrolled circumstances related to work commitments from the part of management or employees especially at Tax Unit for Non-Commercial Professions (TUNC). (A detailed description of the data collection process in each organisation is provided in chapter 5 section 3).

3.5.1 Investigation of case studies

A research was performed on e-government initiatives in Egypt to identify the potential public organisations that could be considered as case studies. A multi-methodological approach was followed. First, the researcher reviewed all publications related to e-government in Egypt. Second, since the responsibility of e-government program was handed to the Ministry of State for Administrative Development (MSAD) since 2003, it was vital to conduct several meetings with key people at MSAD (Head of e-government program, Head of public organisations' automation, several MSAD coordinators with other ministries, e-payment responsible, etc) to get their feedback on the potential public agencies that could serve the research purpose and their availability. Furthermore, an in-depth analysis of e-government portal (http://www.egypt.gov.eg) was conducted. Based

on this investigation, four organisations were selected as case studies: Montaza District (MD), Ministry of Investment (MOI), Tax Unit for Non-Commercial Professions (TUNC), and a public hospital (PH). A full description of each case is provided in chapter 5.

Rationale for the selection of the case studies

The choice of the organisations investigated was based on providing a variety of case studies that could present the whole country to a large extent, covering several types of public organisations in terms of: (i) different sectors; (ii) different e-government stages covering successful organisations and others in initial stages in terms of e-government; and (iii) new and well-established ones. For example, MD was chosen as a case representing a successful case of municipalities (MD website won the first prize in 2005 in the competition of best governmental website held by MSAD). It was therefore important to select another successful case but for a relatively newer organisation such as TUNC (established in 2004) compared to MD that was established in 1982. TUNC was chosen also due to the importance of tax units to both parties: citizens and government. Tax units could contribute to a great deal in facilitating the tax payment process for citizens. As for the government, tax payment constitutes one of its major sources of revenues. This made tax payment among the first services offered online through most of governmental websites worldwide.

It was also important to look for other sectors in the country such as investment and health. The investment sector was chosen since it is accessed by local as well as foreign parties. Furthermore, it is used as a promotion tool to attract Foreign Direct Investment (FDI), through facilitating the investment process by minimising bureaucracy and smoothing legal complexities. MOI was also selected because, although its website (http://www.investment.gov.eg) was launched in 2005, it was considered in a competitive analysis study conducted by Hill and Knowlton Incorporation in March 2005 among other five countries' investment portals, and was ranked fourth (the first three countries were respectively Singapore, South Africa, Poland, and the last two are Dubai and Turkey). MOI's website had since the beginning a great potential for improvement; this can be proved by the success the website realised being ranked first as the best web information page in 2006/2007 in the contest that evaluates all governmental websites in Egypt held by the Information and Decision Support Centre (IDSC) belonging to The Egyptian Cabinet. The last case study was a public hospital (PH) representing the health sector. This vital sector was chosen since it was among the main Millennium Development Goals set by the United Nations. The health sector was also identified as one of the six tracks in building the Egyptian Information Society Initiative (EISI, 2003); the five other tracks were:

Access, Government, Business, Learning, and Culture). PH is considered in its early stage of e-government (very poor website). The selection of these four cases would definitely provide more realistic assessment results since the cases present public organisations in Egypt in several e-government stages (starting from an emerging web presence throughout the whole spectrum until reaching the fifth stage, a networked fully integrated web presence stage (UNDESA, 2008) that changes completely the figure of the public sector), in different sectors (municipalities, tax payment, investment, and health) and with different characteristics (new and well-established ones) as well.

3.5.2 Pilot case study

The last step in the preparation stage involved performing a pilot case study to test the instrument developed for gathering quantitative data. Pilot testing of the measurement instrument was necessary to validate the items and the whole scale. This is because some of the measurement items were developed or modified for the purposes of this research and because the questions in the instrument were newly compiled to form a new questionnaire. This approach helped in identifying the parts of the questions that required modifications and in refining the data collection plan as a whole.

MD was selected as a pilot case due to two reasons: the relatively high number of computer users - who are the target subjects to respond to the questionnaire – compared to their numbers in the other case studies; this made it possible to still have a sufficient number of respondents during the actual data collection phase after excluding the small number of respondents who contributed in the pilot case. The second reason for choosing MD was based on the request of the district's Head; he encouraged conducting a pilot study to verify the viability of such research in the district and to ensure that the language and content of the questionnaire would be understood by the employees. The district's Head, deciding not to interfere directly throughout the entire data collection process to avoid any influence on the feedback of interviewees and questionnaire's respondents, was though monitoring the whole process remotely to provide support for the researcher in case she would face any obstacles during the whole process.

A preliminary questionnaire was first developed to validate the scale items to be used in the study. This questionnaire was translated to the Arabic language because the majority of the employees did not have high English language skills. The preliminary questionnaire was discussed with the top management of the district to obtain their comments. They suggested to include clarifications of additional terms to those explained earlier in the first page of the questionnaire. The questionnaire was then distributed to five employees of different age ranges, educations, and positions to gain their feedback regarding the

content, layout, wording and ease of understanding the measurement items. They were also asked to offer suggestions for improving the proposed scale and for editing the items to enhance clarity, readability, and content adequacy. Based on their feedback some questions were rephrased and simpler terms were used for these questions to be more understandable.

The common concern of the employees was that the questionnaire was very long; this feedback was taken into account in revising the questionnaire. Each question was examined for its relevance to the purpose of the research, which resulted in omitting extra questions (one part of the questionnaire consisting of 6 parts before omission) that would not affect the constructs of each dimension of the research framework. The questionnaire was then reduced from 74 to 54 questions (appendix B contains the last version of the questionnaire).

The pilot case results revealed also the necessity to move the question concerning EGR level from the end of part D to a separate part (part E) to be noticed because it was overlooked by two of the five employees contributing in the pilot case. During the pilot case, three of the five employees (the ones without a graduate degree) expressed difficulty in understanding and answering several issues in the questionnaire. Consequently, the researcher decided to become available during answering the entire questionnaire to clarify whatever appears ambiguous. In particular, questions in part A (see appendix B), related to the strategy dimension, required some explanation but were finally comprehended.

3.6 Data collection methods

The main feature of case studies research strategy over other research strategies is its flexibility in allowing data collection through diverse methods or sources of evidence. Yin (2002) identifies six sources of evidence which are: interviews, documentation, archival records, direct observations, participant-observation, and physical artefacts.

This study relied on four methods adopted in each of the four selected case studies: documentation, archival records, interviews, and direct observations. The following sections explain each method in more detail.

3.6.1 Interviews

Yin (2002) classifies two main types of interviews: open-ended interviews prevailing respondents point of views while following the investigator's line of inquiry, and interviews producing quantitative data. The first interview type, also referred to as unstructured or

semi-structured (Denscombe, 2003), was an essential source of evidence because the researcher believed that it would provide an in-depth insight into several aspects related to each of the organisations studied. The plan was to start by conducting unstructured interviews with top management and IT professionals. This type of interviews did not include specific questions, but just broad areas for investigation aiming mainly to open ideas and thoughts with interviewees. Unstructured interviews encouraged respondents in selected organisations to express their thoughts liberally. This enabled collecting information regarding the main role of IT in the organisation, IT value and impact as viewed by the management, major challenges encountered, etc.

Subsequently, semi-structured interviews (see appendix C) - characterised by including a set of questions in a limited time but addressed in a flexible way - were also conducted with top management and IT professionals to allow them to elaborate on issues viewed as crucial from the researcher's perspective such as, main online and offline services provided by the organisation and the difference between them, level of employees' awareness of the e-government program in the organisation, communication approaches adopted within the organisation and with other public agencies. Semi-structured interviews served also in recognising the number (and availability) of potential respondents capable of answering structured interviews to be conducted later with the employees, and in fine-tuning the developed questionnaire instrument.

The second type of interviews, also referred to as structured interviews (Denscombe, 2003), produces quantitative data, following the sampling procedure and the approaches used in regular surveys. Such interviews were conducted with a sample representing the whole population of employees who use ICT as part of their work, and were willing to respond to a questionnaire.

Sometimes, circumstances permitting, it was possible to organise employees in groups to answer the questionnaire at the same time. The researcher in such cases was able to make the required clarifications to the whole group before and during their response to the questionnaire. In other circumstances and for not altering the work flow in the organisations, the researcher had to clarify some questions to each employee individually while responding to the questionnaire.

To comply with the ethics procedures to be followed in this kind of studies that involve working with people, the researcher presented a research consent form to top management in each organisation and requested their signatures after reviewing it. In addition, as a regular routine, the researcher clarified several issues to each

questionnaire's respondent before handing him/her the questionnaire. Each employee was informed about the purpose of the questionnaire and its anonymous nature. Respondents were also told that their participation in this study was voluntary, not required, and that their refusal to participate would not affect them in any way, and that they could withdraw from this study at any time.

Questionnaire Structure

The questionnaire used in this research was based on three previous studies: Koh and Prybutok (2003) and Liu (2001), developed to measure EGR in City of Denton, Texas, and UNDESA (2003a), addressed to public agencies in any country to assess EGR. Several questions were modified and others were added to reflect all the measuring constructs that exist in the suggested EGR framework.

The first page of the questionnaire contained an introduction that explains some terms included in the questionnaire. The questionnaire consisted of six parts (see appendix B). The first four parts measured employees' perceptions toward the four suggested dimensions of the model: (i) strategy, (ii) processes, (iii) technology, and (iv) people. In each part, each question reflected a measurement construct under the dimension correspondent to this part. The research variables were measured in a 7-point Likert's scale, with 1 as strongly disagree, and 7 as strongly agree. The fifth section contained only one question requesting employees to express their view regarding the extent to which their organisation was ready for e-government. Finally, the sixth section contained personal questions about each subject (e.g. age range, gender, experience with IT, etc.).

Results of this questionnaire constituted a main source of evidence in confirming the research hypotheses (explained in chapter 4, section 4.2), and in revealing the extent to which employees are aware of e-government program and their perception towards it.

The fact that the researcher was available during the whole questionnaire answering process allowed the researcher to conduct semi-structured interviews with some of the employees who responded to the questionnaire. A major purpose of such interviews was to corroborate certain facts acquired from previous data collection approaches, and also to obtain in-depth information that employees cannot reveal in a questionnaire characterised by its rigid nature. Answers from such interviews highlighted the degree of: employees' satisfaction with IT, their ability to adapt with new e-government initiatives, and their level of commitment and loyalty to the organisation.

3.6.2 Documentation

Besides conducting interviews, it was also important to collect data through reviewing available documents in each of the four organisations studied. In each public organisation, there are evidently a number of documents that could be of great help to the study. Some of these documents served in investigating different constructs in the strategy dimension of the framework such as: (i) policies and procedures, (ii) business and IT strategy, and (iii) organisational chart. Policies and procedures governing all activities in the organisation indicated the level of structure and flexibility in each organisation, which would eventually have an effect on the employees and management ability to adopt a new IT system effectively. Business strategy and IT strategy documents revealed the extent of strategic alignment in each organisation.

It was also vital to review the hierarchal structure to understand the different positions and the relations between them, and to investigate how this structure was affected as a result of implementing an e-government program. The organisation's structure was available at MD and TUNC, but the researcher could not access it from the other two organisations (MOI and PH). The hierarchical structure of MD and TUNC was affected as a result of e-government implementation. For example, other departments related to technology maintenance and information systems were formed or sometimes expanded to fulfil e-government needs. Also, at MD, IT management were reporting directly to the District's Head, which proves his involvement, support, and leadership attitude towards e-government at the district. Other important documents such as those related to business processes in each department helped in examining the constructs related to the processes dimension such as well identification of business processes, their streamlining and integration within the organisation and with other public organisations as well. For example, at MD, TUNC, and MOI, business processes were clear and well documented which aided in speeding up the entire workflow.

3.6.3 Archival Records

Reviewing documents was accompanied by examining archival records existing in each of the four organisations under investigation. Archival records encompassed a whole range of files and records compiled by each organisation. These records served in checking some of the constructs of the processes dimension particularly the existence of a regular e-government assessment. One of the main assessments is related to the usage pattern of citizens visiting the organisation's website, and to the feedback of citizens such as the most useful services to them, their complaints, etc. For example, at MD, the researcher reviewed the detailed usage analysis reports that the district issues each month, and the

analyses performed and actions undertaken based on the information they contain. This proved the management's interest in incorporating continuous improvements with regard to e-government implementation. Also, it was important to look over other evaluation techniques and results (when available) performed by each organisation. This denoted whether the organisation is interested in recognising the value of the services provided from both the citizens and the employees' perspectives. It showed also whether this activity was viewed as an ongoing process repeated at certain time intervals determined by the organisation's management.

Other archival records included the existence of previous studies relevant to this study to answer some inquiries raised in the research instead of obtaining the same information another time from employees or management. Previous studies helped also in understanding each organisation's culture, and in avoiding the pitfalls that took place in prior research. Only one study existed at MOI comparing the ministry's website with investment websites in five other countries (see section 3.5.1). This helped in comparing the assessment criteria with those included in the web quality construct under the technology dimension of the research framework proposed earlier.

3.6.4 Direct Observations

In addition to interviews, documents, and archival records, it was also important to collect data through observing the workplace at the four organisations researched. Visiting the case study offered the opportunity to observe relevant behaviours and environmental conditions, which added "new dimensions for understanding either the context or the phenomenon being studied" (Yin, 2002). Such observations constituted an important source of evidence since they shed the light on the employees' working environment, the organisation's workflow, the software applications used and their efficiency, the communication mechanisms followed between management and employees, and the communication skills of the employees who have a direct interaction with citizens. For example, observing the workplace at TUNC revealed the pressure and workload employees are exposed to at TUNC, and how ICT helped them in minimising their workload and in preventing them from committing unintended errors. The presence of the researcher at the workplace proved to be important also at PH; staying for several days at the hospital clarified the main reasons behind their lack in implementing e-government and ICT in general.

3.7 Data Analysis

Analysing data relied on a pattern matching technique, which is, according to Yin (2002) "compares an empirical based pattern with a predicted one". In case a match exists

between these two patterns, the research internal validity can be realised. Consequently, the study tended to check the conformance of the results obtained from the data collected with the hypotheses proposed earlier.

As discussed before, the study used a mixture of quantitative and qualitative data to triangulate them thus confirming findings through several sources of evidence. The following sections discuss the approaches carried out in analysing each type of data.

3.7.1 Analysis of quantitative data

Following the guidelines of Creswell (2002) in data analysis, quantitative data was analysed by first determining the number of valid and invalid responses, and then by developing a descriptive analysis of the data obtained revealing demographics of respondents, and other descriptive data about the research variables such as, means, standard deviations, etc. The researcher selected SPSS program for serving this purpose due to its powerful features in producing descriptive statistics such as variety of variable types, and easy process in coding variables.

The second stage of quantitative data analysis, as noted by Creswell (2002) involved testing the proposed framework through identifying the statistical procedures as well as the reliability and validity approaches, and the software programs to be employed in serving these purposes.

Testing the research model

Testing the research model in each case study was performed in accordance with the four following steps adopted from the study of Liu (2001): a) perform a factor analysis, b) test degree of multi-collinearity, c) check reliability and validity of the model, and d) test the partial models. The researcher followed the steps undertaken in the study of Liu (2001) because it is compatible with this study in: testing research hypotheses in a framework encompassing a number of dimensions, and determining the effect of each dimension using several measuring constructs.

a. Factor Analysis

Using SPSS version 13.0, a factor analysis was carried out to extract and group constructs in each of the four dimensions: strategy, processes, technology, and people; and resulted in an elimination of a number of constructs extracted under each dimension. The extraction method of Principal Axis Factoring was performed using the rotation method of Varimax with Kaiser Normalization. Such technique, presented by Kaiser (1958), is widely used

(Everitt and Dunn, 2001) due to its ability in minimising the number of variables that have high loadings under each dimension for the purpose of simplification (Stevens, 2002). The loading rule was based on retaining constructs with a loading number greater than 0.5 on one factor, and less than 0.5 on all other factors (Hair et al., 1998). The 0.5 and 0.5 rule was used since it is less strict than the 0.5 and 0.3 rule, which prevents as much as possible the removal of many constructs under each dimension (Liu, 2001). It was important to retain as much constructs as possible since they would be significant in measuring each of the four dimensions affecting EGR in the suggested framework.

b. Degree of Multi-collinearity

SPSS version 13.0 was also used to test the degree of multi-collinearity among constructs in each of the four dimensions (strategy, processes, technology, and people) to determine the strength of the relationship between them. As stated by Dielman (1996), presence of a high degree of multi-collinearity among constructs in each dimension results in several problems such as: (i) high and disproportionate standards deviations of the regression coefficients leading to the acceptance of null hypotheses (since coefficients are zero) even though the associated variables have an effect on a dependent variable. As an example, this would result in the elimination of some important constructs in any of the four dimensions which in its turn would minimise the effect of such dimension on the dependent variable EGR; (ii) instability of the regression coefficient estimates (due to the high standard errors) to the extent of resulting sometimes in opposite signs of coefficients that would be against the logic of the research. Such unreliable estimates of the regression coefficients would also cause considerable variations in the coefficients of some variables once one variable was added or removed from the regression.

In addition, Dizney and Gromen (1967) report that the effect of an independent variable on a dependent one could be minimised as a result of high correlation between this independent variable and another independent one. Furthermore, Stevens (2002) highlights a negative consequence of multi-collinearity among independent variables (or predictors) lying in the difficulty in ensuring the influence of a given predictor on a dependent variable due to the confounding effects of the predictors.

Such evidence dictated the need to investigate the strength of relationships between constructs in each of the four dimensions (strategy, processes, technology, and people) of the research that have an effect on EGR. Previous researchers suggest that multi-collinearity exists if correlation between each determinant pair is greater than 0.75 (Dielman, 1996; Liu, 2001).

c. Reliability and Validity

Since the proposed framework was derived from the literature, and the aim of the empirical research was to test this framework, it was important to verify the reliability and validity of the measures used in the research (Cronbach, 1971; Nunnally, 1978) to draw valid inferences from the research leading to theory building. Reliability deals with how consistently similar measures produce similar results (Rosenthal and Rosnow, 1984), whereas validity of a measurement instrument refers to how well it captures what it is designed to measure (Rosenthal and Rosnow, 1984). SPSS version 13.0 was used to calculate both reliability and validity of the measurement instrument.

Reliability

Reliability has two dimensions referred to as repeatability and internal consistency (Zigmund, 1995). Internal consistency refers to the ability of a scale item to correlate with other items in the scale that are intended to measure the same construct. Items measuring the same construct are expected to be positively correlated with each other. A common measure of the internal consistency of a measurement instrument in social sciences research is Cronbach's alpha (Zmud and Boynton, 1991). Cronbach's alpha is widely used because it provides many advantages over other reliability measures. Besides its easy computation, it does not pose any restriction on the types of variables used, and it removes the memory effect possibility when measuring reliability (Bollen, 1989). If the reliability is not acceptably high, the scale can be revised by altering or deleting items that have scores lower than a pre-determined cut-off point. If a scale used to measure a construct has an alpha coefficient greater than 0.70, the scale is considered reliable in measuring the construct (Nunnally, 1978; Leedy, 1997). This indicates a high level of internal consistency or homogeneity among the constructs under each dimension (Straub, 1989). According to Schuessler (1971), a scale is considered to have good reliability if it has an alpha value greater than 0.60. Hair et al. (1998) suggest that reliability estimates between 0.6 and 0.7 represent the lower limit of acceptability for reliability estimates. In this research, the multi-item scales measuring all corresponding constructs under each of the four dimensions affecting EGR (which are: (i) strategy; (ii) processes; (iii) technology; and (iv) people) were checked for reliability by determining Cronbach's alpha, and an alpha value of 0.60 or greater was considered acceptable.

Construct validity

Construct validity is the ability of a measure to confirm a network of related hypotheses generated from a theory based on constructs. Internal construct validity was assessed using factor analysis. Because factor analysis provides evidence of the dimensionality of

a measure, factor analysis with a Varimax rotation was used to determine the number of factors contained in each dimension. An eigenvalue greater than 1 is considered to indicate the presence of an interpretable factor (Kaiser, 1958); therefore factors with eigenvalues greater than 1 were taken into account for further analysis. Such rule is the default one used by SPSS unless another one is specified (Stevens, 2002).

Convergent validity

Construct validity was further evaluated through measuring convergent validity which refers to the extent to which: (i) different scales of constructs indicate the same dimension; and (ii) multiple measures of the same construct are matching (Kerlinger, 1986). Convergent validity was checked to ensure that each group of constructs indicates the same dimension, and to verify the degree of compatibility among multiple measures within the same construct (Kerlinger, 1986). Convergent validity exists "when measures of the same concept have similar patterns of correlations with other variables" (Weisberg et al., 1996). Construct validity was evaluated by following guidelines for measuring convergence proposed by Bagozzi (1981). Bagozzi (1981) states that correlations for items within a dimension should be high. Convergent validity was assessed by measuring the correlation among the corresponding constructs under each of the four dimensions: (i) strategy; (ii) processes; (iii) technology; and (iv) people. High correlations among constructs under each dimension are considered to indicate convergent validity. Existence of convergent validity is determined if all correlations between constructs are higher than 0.5 (Liu, 2001).

d. Partial Models

Testing the research model was achieved through adopting the Structural Equation Modeling (SEM) technique whose true power lies in assessing proposed measurement and structural relations within a model (Kelloway, 1998). Structural Equation Models are models of relationships among constructs that comprise and extend regression and factor analysis procedures (Hayduk, 1987; Bollen, 1989). Mertler and Vannatta (2001) define SEM as a sophisticated version of path analysis incorporating unobservable, un-measurable (latent) constructs into the path model.

SEM was used for three main reasons based on Kelloway's (1998) suggestions. First, since this study used measures to represent constructs, SEM performs explicit tests of both of the overall quality of the model as well as on specific parameters (e.g., factor loadings) composing the model. SEM checks the extent to which the measures reflect the intended constructs. Second, since this study was principally concerned with the

relationships among the measures, SEM techniques allow for the specification and testing of complex path models reflecting causal processes. Third, SEM provides a unique analysis that considers questions of both measurement and prediction. Typically referred to as latent construct models, this form of SEM provides a flexible and powerful means of simultaneously assessing the quality of measurement and examining predictive relationships among constructs. Thus, Cliff (1983) referred to the advent of SEM techniques as a statistical revolution.

LISREL (LInear Structural RELations) version 8.72 was the tool used to test the research hypotheses due to its powerful ability in identifying relations among dimensions (or latent variables), each encompassing several measurable constructs (or observed variables). LISREL is a computer program that analyses covariance structures and that is suitable for the analysis of causal hypotheses or covariance structure models on the basis of non-experimental data. There are two basic types of variables in LISREL: latent variables and observable variables: (i) latent variables that are formulated in terms of theoretical or hypothetical concepts that are not directly measurable or observable; and (ii) observable variables that are directly measurable or observable and can be used as indicators of latent variables. For example, the strategy dimension is considered a latent variable that can be measured by several observables factors such as goals, motives, identification of challenges, etc.).

After inputting data of all the observable variables, LISREL estimates the path coefficients that indicate the effect of each independent latent variable on the dependent latent variable. Mueller (1996) indicates that path coefficients (or regression coefficients) prove two types of relationships: (i) the effect of independent variables on other independent variables; and (ii) the effect of independent variables on dependent variables. That is, path coefficients were used to assess the impact of the strategy dimension (independent variable) on the three other dimensions (independent variables): processes, technology, and people. Path coefficients were also used to check the effect of the four dimensions strategy, processes, technology and people (independent variables) on EGR (dependent variable). LISREL reports also the significance of the path coefficients. The general principle is that if the theory is correct: (i) direct and proximal relationships should be stronger than more distal relationships; and (ii) the model should have strong correlations between the proposed latent variables in the model (strategy, processes, technology, people, and EGR). If correlations among constructs and dimensions exist as well as causal relations between them, a theory can be defined (Kelloway, 1998). A complete description of the proposed model derived from the literature is provided in chapter 4.

3.7.2 Analysis of qualitative data

The analysis of qualitative data took place through several steps; first, data obtained from transcribed interviews, documents, archival records, and observation notes was examined, and several attempts took place to extract the information relevant to the study. This information was supported by quotations from interviews, or specific evidence (Creswell, 2002). External factors affecting EGR (such as, economical, legislative, political, etc.) were excluded during data analysis to focus only on the internal factors under the suggested categories. The next step involved attempts to find connections between these different categories. Qualitative data analysis relied mainly on a "*content analysis*" which is characterised by its theory driven approach through setting a number of rules to be followed during data analysis (Ratcliff, 1996). As an example, the analysis of qualitative data gathered from different sources led to confirming or denying the effect of any of the four dimensions of the proposed framework (strategy, processes, technology, and people) on EGR.

3.8 Data Validation

The data analysis stage was followed by an important phase related with the validation of such data. Based on Creswell (2002) suggestions for data validation, the following techniques are adopted in order to validate the data obtained. First, a triangulation between quantitative and qualitative data was performed to investigate the extent to which they provided the same facts. Second, results obtained from these studies were compared with the primary framework derived from the literature leading to the development of a generic framework for assessing EGR of Egyptian public organisations (comparison of findings with the proposed EGR framework is provided in chapter 7).

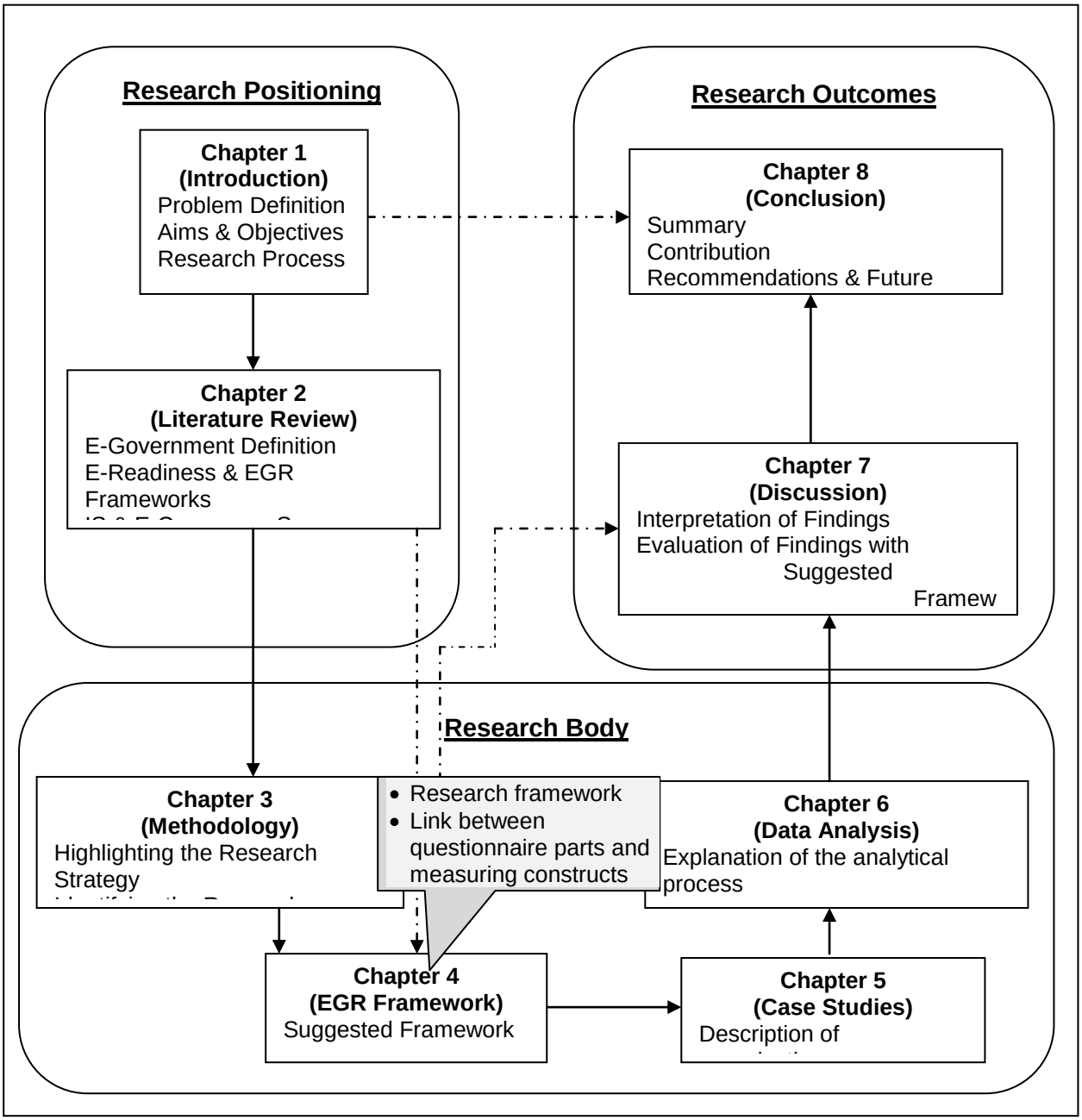
3.9 Summary

This chapter explained the methodology followed in this thesis. In the beginning, it presented both the epistemology and the research strategy that match the research design. Next, the chapter described the desk research stage followed by the preparation for data collection stage that included the pilot case study. Data collection methods were then identified leading to a description of the techniques embraced for data analysis and validation. The next chapter will provide a full explanation of a preliminary framework that was developed based on the literature of relevant fields. The chapter will then highlight the link between the measuring constructs of the framework and the questions contained in the questionnaire instrument distributed to the employees in the four selected case studies.

4. EGR Framework

Objectives of chapter 4

- Explain the different parts of the preliminary research framework.
- Delineate the link between the measuring constructs of the dimensions of the framework and the questionnaire instrument.



question. It showed the steps undertaken towards selecting case study as a research strategy. The chapter identified also the different methods used in collecting quantitative and qualitative data. Quantitative data was obtained through distributing a questionnaire instrument to the employees working in the four public organisations selected as case

studies. Qualitative data was gathered from interviews conducted with top management, documents, archival records, and observation of the workplace in these organisations. This chapter provides a description of the suggested framework that was derived from the literature on e-readiness, EGR, IS and e-commerce assessments. Finally the chapter illustrates how each part of the instrument developed for collecting quantitative data reflects its correspondent measurement construct under each dimension of the framework.

4.1 Suggested framework for assessing EGR

In all e-readiness and EGR assessment models presented in chapter 2, the use of different sets of indicators and different weights assigned to them lead to varying conclusions on the performance of the countries evaluated. Limiting surveying and ranking different nations according to their scores on selected indicators removes the attention from more fundamental issues related to transforming the government by use of ICT. The research gap lies in the absence of a framework that assesses EGR on a micro level, i.e. within a public organisation, addressing the e-administration dimension of e-government that is usually ignored by researchers.

In an attempt to overcome the several shortcomings that exist in previous EGR assessment models, a framework encompassing all internal factors affecting EGR was developed consisting of the following four dimensions: (i) strategy, (ii) processes, (iii) technology, and (iv) people. These dimensions are highlighted in Gartner's four phases of e-government model developed by Baum and Maio (2000), but are restricted to government websites only. Baum and Maio (2000) consider strategy, people, process and technology as requirements to be associated with each of the four website phases: presence, interaction, transaction, and transformation (see table 4.1).

	Presence	**Interaction**	**Transaction**	**Transformation**
Strategy	Approval level Public domain	Fee for information Public response	Competition Confidentiality/privacy Fee for transaction E-authentication	Funding stream allocations Agency identity Big browser
People	Existing staff	Content management Increased support staff Governance	Self services Skills set changes Portfolio management Sourcing Increased business staff	Job structures Relocation/telecommuting Organisation Performance Accountability Multiple-programs skills Privacy reduces
Process	Streamline processes	KM E-mail BP Content management Metadata Data synchronization	BPR Relationship management Online interfaces Channel management	Integrated services Change value chain New processes/services Change relationships (G2G, G2C, G2B, B2E)
Technology	Website online content	Search E-mail	Legacy system links Security Information access 24/7 infrastructure Sourcing	New applications New data structures New standards

Table 4.1 – Gartner's Four Phases of E-Government (Baum and Maio, 2000)

Although website existence is an integral part of e-government, e-government encompasses other means to provide services to citizens. Moreover, referring to the definition of e-government discussed in chapter 2 (section 2.1), e-administration should not be completely related to web presence; a public organisation can start its IT strategy focusing on e-administration first, and then establish a web presence. As a result, the above four dimensions can be applied on e-administration as well, which is the main topic of this study. An EGR assessment framework was developed based on the four dimensions that have an effect on EGR, which are: (i) strategy, (ii) processes, (iii) technology, and (iv) people. A number of constructs (derived from information systems success, e-commerce success, e-readiness, and EGR literature) were covered under each dimension (see figure 4.1). Such a framework would act as a checklist for public organisation management to verify the presence or absence of each element under each dimension of the framework. In addition, applying this framework for assessing EGR would show the effect of each of these four dimensions on EGR, and the weight of each construct under each dimension. The four phases of e-government websites presented in table 4.1 (presence, interaction, transaction, transformation) were included as part of evaluating website quality under the technology dimension. It was vital to consider them due to their importance in determining the maturity of websites in public organisations.

As stated above, the proposed framework addressed only internal factors affecting EGR. The reason behind excluding external factors (as explained in chapter 3, section 3.4) was

because the research aim was to investigate how under the same external factors that are applicable to all organisations in a country, variations of the strength of internal factors could change the degree of EGR among these organisations. Also, due to the large number of these internal factors, the researcher decided to study them thoroughly especially that the external factors were already addressed in the majority of e-readiness and EGR assessments.

Figure 4.1 – Proposed E-Government Readiness (EGR) Framework

4.2 Description of the suggested EGR framework

Each dimension in the framework contains a number of measuring constructs derived from the literature. A questionnaire instrument was developed to be employed as a source of evidence (besides other qualitative data collection methods) for testing the suggested framework. It was distributed to employees working in four public organisations in Egypt to get their feedback regarding the strategy, processes, technology, people, and EGR situation in their organisations. The questionnaire consisted of six parts (see appendix B): the first four parts (parts A, B, C, D) measured employees' perceptions toward the four suggested dimensions of the framework: strategy, processes, technology, and people. In each part, each question reflected a measurement construct under the dimension corresponding to this part. Research variables were measured in a 7-point Likert's scale.

The fifth part (part E) contained only one question requesting employees to express their view regarding the extent to which their organisation was ready for e-government on a scale ranging from 1 (extremely unready) to 7 (extremely ready). Finally, the sixth part (part F) contained personal questions about each subject (e.g. age range, gender, experience with IT, etc.).

The following sections explain the theoretical background from which all constructs under each dimension are derived. A table is provided for each dimension that shows its related measuring constructs along with their corresponding question(s) in the questionnaire instrument listed in appendix B.

4.2.1 Strategy

The need to set out a robust strategy for e-government is a major factor in reaching a successful e-government adoption (Reffat, 2003; Fletcher, 1999). An efficient strategy should identify first the main drivers for implementing e-government (Working Group on E-Government in the Developing World, 2002). Recognising these drivers highlights their importance, and helps in setting an appropriate action plan. E-government strategy should also set a number of goals (Forman, 2002) - to justify its cost and to check the extent to which these goals were achieved - and should identify potential challenges (Margetts and Dunleavy, 2002): technological, administrative, legislative, economic, and political (Pilipovic et al., 2002). Highlighting challenges at an early stage helps in setting appropriate solutions (Weerakody et al., 2005) with the right priorities (Chen and Knepper, 2005). An e-government strategy should also be aligned with the organisation's business strategy, referred as strategic alignment, (Beaumaster, 2002; Baets, 1992; Bowman et al., 1983; Das et al., 1991; Henderson and Venkatraman, 1993). Strategic alignment impacts overall organisation and business performance (Xia and King, 2002; Croteau et al., 2001), and helps in perceiving higher payoffs from IT (Tallon et al., 2000).

In addition, an e-government strategy should set an action plan (UNDESA, 2003a; WASEDA University, 2006) including accountability (Navarra and Cornford, 2003; Heeks, 2001), organisation's structure (Snellen, 2000; Baum and Maio, 2000), resource allocation (Fletcher, 2003), IT policies and procedures (Powell and Dent-Micallef, 1999; Zahra and Covin, 1993), and leadership (WASEDA University, 2006; NSW, 2001). Action plan should also investigate funding sources (WASEDA University, 2006; NSW, 2001), and identify e-government different stakeholders (Mitchell et al., 1997; Tennert and Schroeder, 1999) in order to determine their roles (Frooman, 1999; Bryson and Alston, 1996) as well as the value to be reflected on each of them (Aldrich et al., 2002; Traunmüller and Wimmer, 2003; Sprecher, 2000; West, 2000). Finally, an action plan should develop the means to

promote e-government to build awareness among all stakeholders (Hu et al., 2005; WASEDA University, 2006).

Table 4.2 presents the various suggested constructs of the e-government strategy dimension along with their corresponding question(s) placed in part A (comprising 8 questions) of the questionnaire instrument. Research variables of the strategy dimension are measured in a 7-point Likert's scale, with 1 as strongly disagree, and 7 as strongly agree.

Construct	Question No.
Strategy	Question 1
Goals	Questions 2,3
Motives or Drivers	Question 4-a
Identification of Challenges	Question 4-b
Strategic Alignment	Questions 4-c, d, e
Action Plan	Question 5
Organisation: Resource allocation	Question 6-a
Organisation: Accountability	Question 6-b
Organisation: Structure	Question 6-c
Organisation: IT Policies and Procedures	Question 6-d
Organisation: Leadership	Question 6-e Questions 7-a, b, c Question 8
Funding Resources	Questions 6-f, g
Stakeholders: Identification	Question 6-h
Stakeholders: Role	Question 6-i
Stakeholders: Value	Question 6-j
Promotion	Question 6-k

Table 4.2 - Main Constructs of "Strategy" and Corresponding Questions (Part A of the Questionnaire in Appendix B)

Showing the value of e-government strategy along with its different underlying items led to the following hypothesis:

Hypothesis 1 (H1): E-government strategy should be considered in an EGR assessment of an organisation.

4.2.2 Processes

Processes to be undertaken by an e-government initiative are classified into two main categories: Business Process Change (BPC) and e-government evaluation (see table 4.3). Several studies highlight the value of BPC in e-government success (Scholl, 2003; Kettinger et al., 1997; Pardo and Scholl, 2002; Heeks, 2001; Seybold, 1998). First, the motives for change should be determined (Scholl, 2005), and the focal areas where these change should take place (Harkness et al., 1996; Kettinger and Grover, 1995; Balutis, 2001). Business processes should also be defined, documented and streamlined

(Rimmer, 2002; Guo and Lu, 2005; Baum and Maio, 2000) to improve information flow within the organisation.

Business processes should also be integrated internally, and with other public agencies as well (Accenture, 2005; Ho, 2002; Moon, 2002; Tapscott, 1995; Chen and Knepper, 2005; Rimmer, 2002; Layne and Lee, 2001).

Furthermore, the framework considers evaluation of e-government performance as a systematic approach to be performed periodically. Evaluation should always compare plans with real situations (Heeks, 2003); this aids in rectifying deviations from the plans at an early stage. Evaluation should also take into account the use of e-government services by citizens (Gefen et al., 2002) and ICT usage by the employees in the organisation (CSPP, 2000; Liu, 2001; DeLone and McLean, 1992; Marchionini et al., 2003; Schedler and Scharf, 2001). It is also essential to conduct periodic evaluations to understand how citizens perceive e-government from different perspectives such as usefulness and ease of use (Davis, 1985, 1989), satisfaction (DeLone and McLean, 1992; Livari and Ervasi, 1994; Cyert and March, 1963; Downing, 1999; Bailey and Pearson, 1983; Igbaria and Nachman, 1990), and trust (Adams, 1999; Edmiston, 2003; Chen and Knepper, 2005; Gefen et al., 2002; Tassabehji, 2005). Periodic evaluations should also be extended to investigate employees' perceived usefulness and ease of use (Davis, 1985, 1989), and satisfaction (DeLone and McLean, 1992; Bailey and Pearson, 1983; Davis, 1985, 1989; Igbaria and Nachman, 1990; Rai et al., 2002; Seddon, 1997; Seddon and Kiew, 1996; Seddon et al., 1999; Wilkin and Castleman, 2003). Finally, evaluations should be performed to assess the development of the impact of e-government on all stakeholders (DeLone and McLean, 1992; Seddon, 1997).

Table 4.3 presents the various suggested constructs of the processes dimension along with their corresponding question(s) placed in part B (comprising 15 questions) of the questionnaire instrument. Research variables of the processes dimension were measured in a 7-point Likert's scale, with 1 as strongly disagree, and 7 as strongly agree.

Construct	Question No.
Business Process Change (BPC)	Question 1
Motives of BPC	Question 2
Focal Areas of Business Process Change (BPC)	Question 3
Definition of Business Processes	Question 4
Documentation of Business Processes	Questions 5
Streamlining of Business Processes	Question 6
Vertical Integration	Question 7
Horizontal Integration	Question 8
Evaluation	Question 9
Design/Reality Gap	Question 10

Usage by Citizens	Question 11
Usage by Employees	Question 12
Citizens' Feedback: Perceived Usefulness	Questions 13-a
Citizens' Feedback: Perceived Ease of Use	Question 13-b
Citizens' Feedback: Satisfaction	Question 13-c
Citizens' Feedback: Trust	Question 13-d
Employees' Feedback: Perceived Usefulness	Question 14-a
Employees' Feedback: Perceived Ease of Use	Question 14-b
Evaluation: Employees' Feedback: Satisfaction	Question 14-c
Evaluation: Impact on Stakeholders	Question 15

Table 4.3 - Main Constructs of "Processes" and Corresponding Questions (Part B of the Questionnaire in Appendix B)

Highlighting the importance of processes as an integral factor in affecting e-government directed the researcher to set the second hypothesis:

Hypothesis 2 (H2): Organisational processes should be included in an EGR assessment of an organisation.

4.2.3 Technology

Evidently, technology constitutes an important factor influencing e-government success (NSW, 2001). Technology comprises IS structure, hardware, and service quality (see table 4.4). Information systems structure covers information quality (DeLone and McLean, 1992; Bailey and Pearson, 1983; Ahituv, 1980), system quality (DeLone and McLean, 1992; Bailey and Pearson, 1983; Bhimani, 1996), web presence quality (UNDESA, 2005; West, 2000, 2006; WASEDA University, 2006; Accenture, 2002, 2005; Turban et al., 2002; Liu and Arnett, 2000; DeConti, 1998; Eschenfelder et al., 1997; Burgess and Cooper, 1999; Smith, 2001; Boon et al., 2000; Farquhar et al., 1998; Fogg, 2002; Fogg, et al., 2002; Hamilton and Chervany, 1981; Ho and Wu, 1999; Kossak et al., 2001; Swanson, 1986; Wan, 2000), and security measures (NSW, 2001; Ben Abd Allah et al., 2002; Conklin and White, 2006; Boudriga, 2002). Technological dimension should also consider the quality of the hardware (Victoria, 2002), and the technical support and development provided by the IT department to the entire organisation referred as service quality (CSPP, 2000; Woodroof and Burg, 2003; Pitt et al., 1995; Li, 1997; Wilkin and Hewett, 1999; Wilkin and Castleman, 2003).

Table 4.4 presents the various suggested constructs of the technology dimension along with their corresponding question(s) placed in part C (comprising 20 questions) of the questionnaire instrument. Part C was divided into two main sections: the first investigated different factors related to IS structure such as the quality of: data and information, software, website, security (questions 1 to 4), and the quality of hardware (question 5).

The second section was related to the technical support provided to the employees through the Technical Services Department (TSD) in their organisation (questions 6 to 20). Research variables of the technology dimension were measured in a 7-point Likert's scale, with 1 as far short of expectations to 7 as greatly exceeds expectations.

Construct	Question No.
IS Structure	
Information Quality: Content	Question 1-a
Information Quality: Availability	Question 1-b
Information Quality: Accuracy	Question 1-c
Information Quality: Timeliness	Question 1-d
Information Quality: Convenience	Question 1-e
Information Quality: Vertical Integration	Question 1-f
Information Quality: Horizontal Integration	Question 1-g
Information Quality: Internet Integration	Question 1-h
Information Quality: Overall	Question 1-i
System Quality: Reliability	Question 2-a
System Quality: Ease of Use	Question 2-b
System Quality: Accessibility	Question 2-c
System Quality: Usefulness	Question 2-d
System Quality: Flexibility	Question 2-e
System Quality: Vertical Integration	Question 2-f
System Quality: Horizontal Integration	Question 2-g
System Quality: Internet Integration	Question 2-h
System Quality: Overall	Question 2-i
Web Presence Quality: Usability	Question 3-a
Web Presence Quality: Layout	Question 3-b
Web Presence Quality: Navigation	Question 3-c
Web Presence Quality: Consistency	Question 3-d
Web Presence Quality: Content	Question 3-e
Web Presence Quality: Number of Services	Question 3-f
Web Presence Quality: Presence Stage	Question 3-g
Web Presence Quality: Interaction Stage	Question 3-h
Web Presence Quality: Transaction Stage	Question 3-i
Web Presence Quality: Transformation Stage	Question 3-j
Web Presence Quality: Overall	Question 3-k
Security Measures: Data Protection	Question 4-a
Security Measures: Software Protection	Question 4-b
Security Measures: Data Transfer over Networks	Question 4-c
Security Measures: Access Privileges	Question 4-d
Security Measures: Safety of Electronic Payment	Question 4-e
Security Measures: Overall	Question 4-f
Hardware	
Efficiency	Question 5-a
Vertical Integration	Question 5-b
Horizontal Integration	Question 5-c
Overall	Question 5-d
Technical Support and Development	
Reliability	Questions 6, 7, 8
Competence	Questions 9, 10
Responsiveness	Question 11
Timeliness	Questions 12, 13
Communications	Questions 14, 15, 16, 17, 18
Commitment	Question 19
Access	Question 20

Table 4.4 - Main Constructs of "Technology" and Corresponding Questions (Part C of the Questionnaire in Appendix B)

The effect of technology on EGR presented in the literature led to the third hypothesis:

Hypothesis 3 (H3): Assessing technology effect on EGR in an organisation should comprise several factors such as the quality of: information, applications, organisation's website, security measures, hardware, and technical service provided by the IT department in the organisation.

4.2.4 People

People are one of the main factors in the success of e-government (NSW, 2001). Several constructs exist in this dimension such as, user satisfaction (DeLone and McLean, 1992; Bailey and Pearson, 1983; Davis, 1985, 1989; Igbaria and Nachman, 1990; Rai et al., 2002; Seddon, 1997; Seddon and Kiew, 1996; Seddon et al., 1999; Wilkin and Castleman, 2003), assessing satisfaction of e-government from the part of employees using IT. Also, it is vital to detect the impact of e-government on them (DeLone and McLean, 1992; Seddon, 1997). Furthermore, employees' skills should be taken into account such as, adaptation to change (Bertelsmann Foundation, 2002), proficiency in using IT (ICMA, 2002), ability to communicate with other employees within and outside the organisation (Powell and Dent-Micallef, 1999), and providing an adequate service to citizens (Accenture, 2002, 2005). Finally, there should be a special focus on the training to be provided to the employees in order to develop their various skills (Baum and Maio, 2000).

Table 4.5 presents the various suggested constructs of the e-government people dimension along with their corresponding question(s) placed in part D (comprising 13 questions) of the questionnaire instrument. Part D was divided into two main sections: the first on a scale from 1 (strongly disagree) to 7 (strongly agree) included employees' satisfaction, impact on them, their skills, and their perceptions towards IT (questions 1 to 6). The second section was about the quality of IT training provided to the employees (questions 7 to 13) on a scale from 1 (far short of expectations) to 7 (greatly exceeds expectations).

Construct	Question No.
User Satisfaction	Question 1
Impact on Employees	Question 2
Skills: Adaptation to Change	Question 3
Skills: Integration	Question 4
Skills: Customer Service	Question 5
Like Computers	Question 6
HR Training and Development	Questions 7, 8, 9, 10, 11, 12, 13

Table 4.5 - Main Constructs of "People" and Corresponding Questions (Part D of the Questionnaire in Appendix B)

Recognising the value of people in EGR guided the researcher to the fourth hypothesis:

Hypothesis 4 (H4): An organisation's EGR assessment should take into account different aspects related to the employees such as soft and technical skills, their perceptions towards ICT in their daily work, and the training courses provided to them.

4.2.5 Inter-relations between the four dimensions

The study argued that all three dimensions: processes, technology, and people, are affected by e-government strategy since this strategy comprises a number of aspects that cause major changes in them. E-government strategy is usually absent, or at least not particularly considered in most developing countries. Absence of strategy in e-government projects is due mainly to the lack of a common vision that guides each project in government environment characterised by continuous political, economical, and governance inconsistencies. An efficient e-government strategy, if followed, should have a direct impact on processes, technology, and people. Consequently, this study suggests that the strategy dimension acts as a meta-dimension (i.e. a dimension of dimensions): first in directly affecting EGR, and second in indirectly affecting EGR through the other three dimensions: processes, technology, and people. This led to the following three hypotheses:

Hypothesis 5a (H5a): E-government strategy in an organisation should be reflected on the processes followed.

Hypothesis 5b (H5b): The technology in an organisation should be planned on a strategic level.

Hypothesis 5c (H5c): Top management should emphasize on the development on employees' skills and satisfaction when formulating an e-government strategy.

Figure 4.2 shows the revised version of the suggested EGR framework containing the first four hypotheses (presented earlier in the framework in figure 4.1), in addition to the last three hypotheses (H5a, H5b, H5c) explained above.

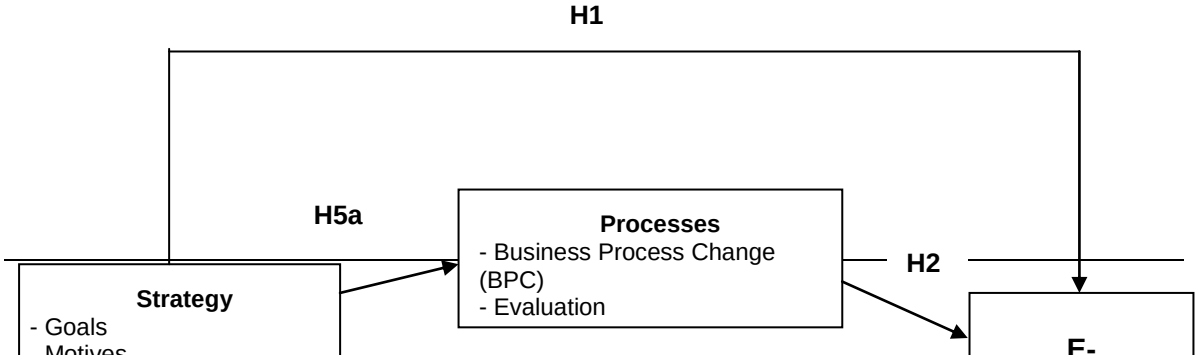


Figure 4.2 – Proposed E-Government Readiness (EGR) Framework (Revised Version)

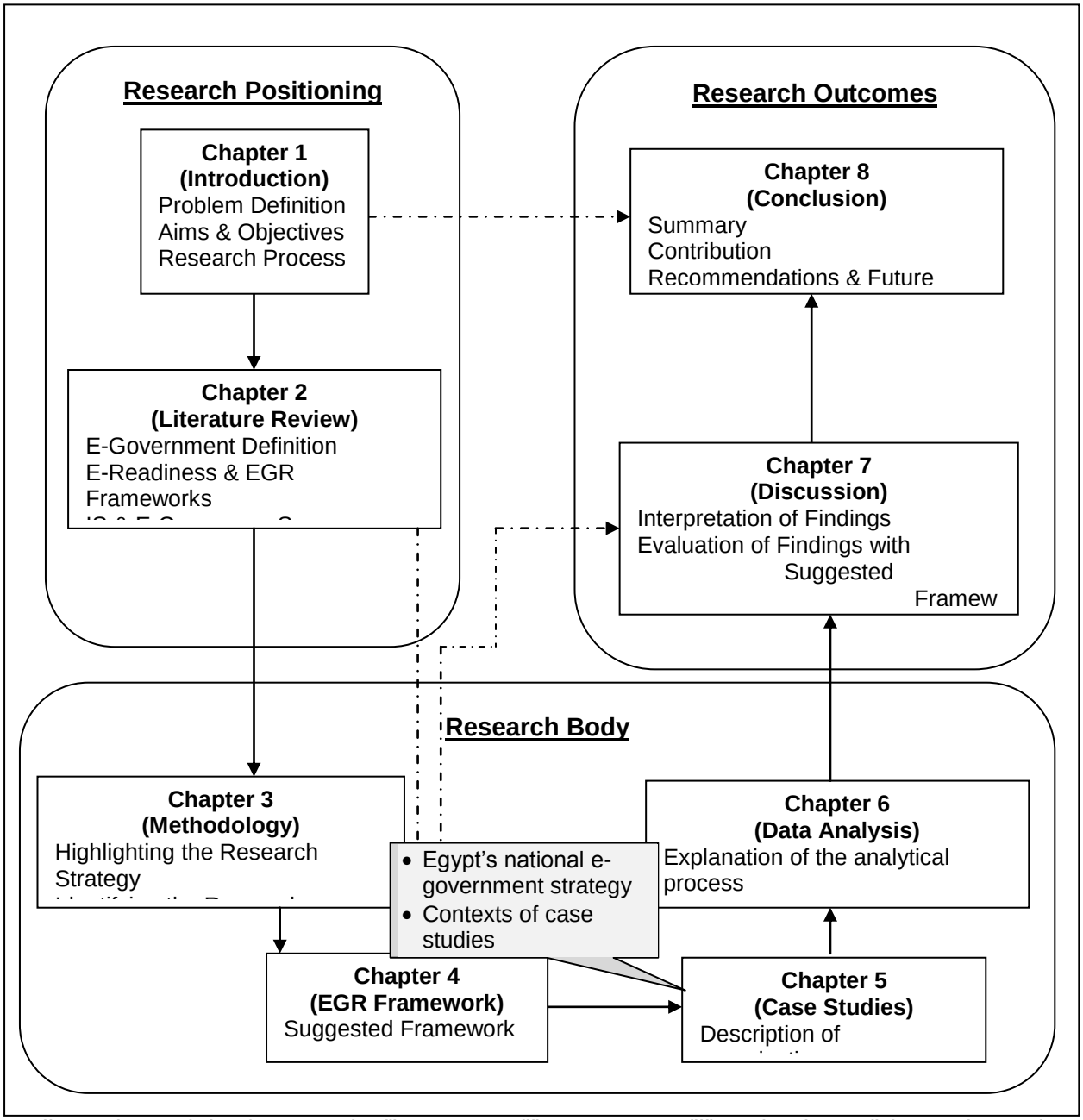
4.3 Summary

This chapter presented an explanation of the suggested framework that assesses E-Government Readiness (EGR) of a public organisation. The framework constructs were derived from the literature on e-readiness, EGR, IS, and e-commerce assessments. The chapter highlighted the link between the different parts of the questionnaire instrument and the corresponding constructs of each of the four dimensions of the framework: strategy, processes, technology, and people. The questionnaire instrument was used for the empirical research that was undertaken to test the suggested EGR framework in the four selected case studies that represent public organisations in Egypt. The next chapter will provide a detailed explanation of the context of these four organisations. The chapter will also describe the overall data collection process undertaken in each organisation followed by a critical analysis of the entire process.

5. Case Studies

Objectives of chapter 5

- Provide an overview of the e-government initiative of Egypt.
- Describe the context of each of the four case studies selected for the empirical research.
- Explain and analyse the overall data collection process.



dimensions of the framework: (i) strategy, (ii) processes, (iii) technology, (iv) people, and the measuring constructs under each dimension. Each measuring construct is derived from the literature on e-readiness, EGR, IS and e-commerce success models. The

chapter provided also the link between each measuring construct and its correspondent question(s) in the developed measurement instrument that was distributed to the employees working in the four public organisations selected as case studies. This chapter describes the context of the study by first providing an overview of Egypt's national e-government strategy which helps in highlighting the link between the national strategy and this research, and then by explaining the context of the four organisations selected as case studies. The choice of these organisations was based on the importance of the sector they are related to, and to their e-government maturity level. It was also taken into account to select well established organisations that are considerably old in addition to new founded ones. The objective was to seek as much as possible to choose case studies that could best represent public organisations in Egypt. Finally, the chapter explains the data collection process in the four organisations and summarises the researcher view about the entire process.

5.1 Country profile

Egypt has taken an e-government initiative since the introduction of the Ministry of Communication and Information Technology (MCIT) in 1999, as part of its plan to turn Egypt into an information-based society. The vision of e-government initiative in Egypt is "delivering high quality government services to the public in the format that suits them" (EISI Government Team, 2003). Such vision relies mainly on three principles that include: 1) citizen centric service delivery, 2) community participation, and 3) efficient allocation of government resources (EISI Government Team, 2003). E-government vision – once articulated - led to formulate Egypt's e-government strategy, directed mainly towards utilising ICT to enhance government readiness; thus to realise a strong local program and to smoothly integrate in the global community (Darwish, 2007). The main projects guided by this strategy - related to the third principle of the national vision (efficient allocation of government resources) - are back office automation and automation of local governorates (EISI-Government Team, 2003). This proves the focus on automating back office over both central and local governmental agencies since the beginning of the Egyptian e-government program.

The official inauguration of the Egyptian e-government portal (http://www.egypt.gov.eg) took place in 25 January 2004 and was attended by Bill Gates during his first visit to Egypt, as Microsoft was chosen to be in charge of the project's implementation. Some services were placed in the portal to pilot test the project such as telephone e-billing, birth certificate issuing, car license renewal, etc. With the new cabinet announced in Egypt in July 2004, the e-government program became the responsibility of the Ministry of States

for Administrative Development (MSAD) instead of MCIT. This decision indicates the clear vision of e-government program perceived as a transformative project affecting all government organisations rather than a technological one.

Egypt's e-government program has identified a number of objectives to realise a successful implementation of e-government and that includes (but not limited to): 1) tailoring government services to meet citizens expectations, 2) creating a conducive environment to investors (local and international), 3) availing accurate and updated government information, 4) increasing government efficiency through modern management techniques and new working models, 5) reducing government expenditure and 6) fostering local competitiveness and increasing globalisation readiness (EISI Government Team, 2003).

The above objectives cannot be realised without considering E-Government Readiness (EGR) on a macro level (i.e., of the overall country) as well as on a micro level (over public organisations). Assessing EGR of public organisations helps in understanding the internal factors related to each organisation that affect EGR, and that would contribute on the success of e-government in a public organisation. The importance of internal factors is apparent when examining the different levels of progress of e-government in public organisations in the same country; even though these organisations are exposed and affected by the same external factors related to the entire country. E-government policy makers in Egypt were interested in assessing the country's overall EGR since 2003 through undertaking a qualitative comparison of UN EGR criteria with ICT readiness of Egypt (EISI-Government Team, 2003). Assessing EGR of public organisations is largely considered also; this can be deduced from the interest of e-government key responsible administrators in this research (Dr. Hatem elKady, E-Government Program Manager, expressed his interest in getting the research findings). In addition, MSAD performs a yearly survey to assess EGR of public organisations (see the fifth issue of this survey on (http://www.msad.gov.eg). The survey provides an insight about the skills of the employees and the technology components within each organisation. MSAD responsible executives send periodically only one questionnaire form to each organisation's manager asking him to reply and resend it to MSAD. Such information is aggregated and serves as a documentary source to determine the skills of employees and the technology standards in Egyptian public organisations.

The development/implementation of Egypt's e-government programme is in continuous progress. The fact that the country's ranking has been improved in two separate studies – conducted regularly to evaluate EGR over the past few years - advocates the evolvement of

Egypt's e-government provision and initiatives. The first is the global E-Government Readiness by Darrell West, Brown University - evaluating 198 countries around the world based on their national websites – where Egypt ranks 73rd in 2008 compared to 81st in 2007. The other assessment is the EGR reports conducted by the UN, where Egypt ranks 79th over 193 countries in 2008 compared to 99th in 2005 (no UN ranking reports were issued in 2006 and 2007).

It is expected that there will be much higher demand on online services due to the growing number of: Internet users (increased from 300,000 in October 1999 to 13.7 million in July 2009), fixed telephone lines (increased from 4.9 million in October 1999 to 11.8 million in March 2009), and mobile users (increased from 654 thousands in October 1999 to 50 million in July 2009 (MCIT, 2009).

5.2 Description of the research case studies

This section provides further support on how the research investigated Egypt's e-government environment. This was done through a number of case studies aiming to represent Egypt for assessing EGR. Four public organisations were chosen: Montaza District (MD), Tax Unit for Non-Commercial Professions (TUNC), Ministry of Investment (MOI), and a Public Hospital (PH), requested by its top management to be anonymous.

MD was selected because it represents a successful example of municipalities that was founded long time ago (since 1982), which triggered the desire to investigate TUNC as an example of a successful organisation that is relatively new (since 2004), and because presenting citizens' income statement is among the first services provided usually through governmental websites worldwide due to its importance to both citizens and governments. It was also pivotal to conduct studies on MOI, since investment constitutes a promising sector in Egypt. This can be deduced from the foundation of a ministry dedicated for this purpose, where e-government represents a corner stone in its structure through the launching of a portal that aims to attract foreign direct investment.

The last case study, a public hospital (PH), represents the health sector - although an essential sector - is one of the sectors that is still suffering from several problems. The health sector, being in an early stage in terms of e-government and in information technology as a whole, was another driver in examining a case in this sector. This would help in investigating how e-government implementation could contribute in enhancing

administrative efficiency and quality of services in this sector. The next sections provide a description of each of the four case studies researched.

5.2.1 Case study 1 - Montaza District (MD)

Montaza District (MD) is located in Alexandria (one of Egypt's 29 governorates located in North Egypt on the Mediterranean, and the second largest city in Egypt after Cairo). In general, metropolitan governorates, such as Alexandria are divided into districts. Decision making in each district, concerning financial and administrative affairs, is performed across various levels reflecting different levels of responsibilities. For example, detailed responsibilities such as executing the governorate strategy, dealing with the district's citizens, and allocating limited resources to investment are managed by the District Executive Committee headed by the District Head. Higher level decisions are considered and taken in the monthly Governorate Executive Committee meeting headed by the Governor. Districts Heads are key members of this committee along with representatives from 14 different service sectors such as health, education, etc. and other entities representing other authorities in the governorate. Governors submit periodical reports to the Minister of Local Development who heads the quarterly Governors' Committee comprising also the Governors of the 29 Governorates. It is important to note that the Minister reports directly to the Prime Minister (MOLD, 2008; Ahmed and Hassan, 2007; interviews with consultant of the Minister of Local Development and with MD Head).

MD's area is 92 square kilometres; it has a population of 1.023 million, deeming it the highest population among the other five districts of Alexandria with around 25% of its total population (4.110 million). MD offers a total of 69 services to citizens such as, issuance and renovation of permits (stores, buildings, digging), issuance and re-issuance of certificates, etc.

The district started its e-government program since 2003 focusing on using ICT to reach two main objectives: simplify and speed-up the procedure in providing services to the citizens in case of physical interaction, and enable citizens to get the services remotely. The first objective was realised to a great extent by placing public kiosks in several convenient locations, handling any service with MD on behalf of the citizen; and by availing instantly 38 services (around 55% of total services offered), i.e. to be completed in only 30 minutes or less. More services are to be transferred to instant ones. The second objective was attained by launching a web site for MD (http://www.montazaonline.com).

Online services constitute 20% of all services offered by MD. Since electronic payment is not yet implemented, services requiring fees cannot be completed online. Payment can be upon delivery, or at the district's premises. Citizens cannot submit documents electronically but they can review what documents are required for each service in order to have them ready ahead of visiting the district. The absence of electronic payment, and the inability of citizens to send documents online restricted the number of online services that could be completed entirely through the website; this makes completed online services constitute 40% of all online services (as revealed by the IT Manager of MD). Other important services are provided through the website such as, checking the status of a property, tracking the status of the services sought, and applying for and following-up on services requested from other public entities. This latter function automatically meant an intermediary role for MD with other governmental entities. The website gives also its visitors insight on most issues related to the district such as events and attraction places.

5.2.2 Case study 2 - Tax Unit for Non-Commercial Professions (TUNC)

Tax Unit for Non-Commercial Professions (TUNC) is one of the five tax units in Cairo's 8th area. In fact, Egyptian Tax Authority (ETA) – a division of the Ministry of Finance (MOF) - has divided each governorate geographically into several areas. For example, Cairo, the capital and highest-populated governorate is divided into eight main areas, and each area comprises several tax units. Each unit assumes responsibility over a group of financiers (i.e. tax payers) where each has to present his income statement into the unit he's enlisted in. Tax payment and reviewing income statements take place afterwards through communication between financiers and their corresponding units' tax representatives.

TUNC was founded in November 2004 in an attempt to separate the tax collection of non-commercial professions from tax collection of other sectors. Non-commercial professions comprise citizens working as physicians, lawyers, accountants, engineers, etc., who run their private business or practice. TUNC serves now 58000 financiers whose businesses are in its geographic domain. Each of the 70 employees (i.e. the tax representatives) serving financiers has a computer connected to the wide area network that connects TUNC to the central administration of ETA. The tax representative can access any information about the group of financiers under his responsibility such as their status and transactions with the tax unit. He can also inquire about them in other governmental entities such as customs and charges in courts.

TUNC was among the first tax units to adopt the e-government program set by ETA. ETA started this program in 2006 on a small number of tax units and plans to implement it over all tax units in Egypt in the future. The main objective of implementing e-government is to

enhance the services provided to citizens, hence being in accordance with the national e-government program. The first implementation stage was through improving e-administration in several tax units by: (i) providing a computer to each employee, especially those who have a direct contact with citizens; (ii) automating the workflow; and (iii) integrating some business processes internally and with other organisations. The second stage was performed by enabling financiers to communicate with ETA through the Internet.

ETA added different services through the Egyptian e-government portal such as, registering a new activity, notifying ETA of a temporary or permanent halt, applying for a tax ID, or presenting income statements. Citizens can even send a bank check to affect payment without having to physically go to their correspondent tax units for payment. A call center was established in 2007 to answer financiers' inquiries about e-services provided by ETA. All financiers' communications with ETA through the Internet are first submitted to the central administration, and then sent to the correspondent tax unit. Information about all financiers is stored once at the database servers located at the central administration. Since all tax units are connected to central administration through a wide area network, employees in tax units can access financiers' information from the database at the central administration. The fact that such information is stored in only one place prevents data errors that could result from duplication of data.

The main challenge that faces ETA in terms of IT is the ability to keep up with the turbulent environment of frequent change in regulations in national tax law. ETA is working on several e-government projects simultaneously. Among the most important ones is the automation of the entire workflow within each tax unit, and externally between the central administration and all tax units through the wide area network that connects them. In addition, a full e-payment solution is to be implemented through providing digital signature for each financier. Another project is concerned with the implementation of a smart card reader technology, where each financier's profile is to be stored in a smart card (up to 64 Kilobytes capacity, holding 5 years transactions). Such project started in 2007 and expected to be completed in 2010.

5.2.3 Case study 3 – Ministry of Investment (MOI)

The Egyptian Ministry of Investment (MOI) was established in July 2004 to support the government's mandate to implement reform programmes. The main aim of MOI is to improve investments in different sectors adopting the role of coordinator of institutions and ministries, and implementing the asset management programme. Being the main responsible of investment initiatives in Egypt, MOI supervises nine affiliated entities concerned with all activities

related to the investment in Egypt such as free zones, capital market, exchange, insurance, mortgage finance, etc.

MOI's website (http://investment.gov.eg) is one of the major tools that help the Ministry in attaining its aim (the Minister's IT Consultant of MOI revealed that the Minister believes that 40% of the success of the investment sector in Egypt is attributed to the existence and implementation of information technology in the Ministry). The website helps to promote and encourage investments in Egypt since it provides information required by investors. The website presents also opportunities for investment in different sectors in Egypt, in addition to an overview of the economy and the laws that govern investment in the country. The website provides also investment guidelines through assisting investors throughout their business stages from planning to implementation and future growth. The content of the website is offered in four languages: Arabic, English, French, and Chinese. The main services accessed on the website are searching in the companies' database, reports on business sectors, investment opportunities, and ministerial committees to solve conflicts (interview with the Minister's IT Consultant of MOI).

There are 200 employees in the Ministry distributed in a different way than any other organisation; seniors constitute the majority of staff (=140), and the rest of the employees (60) work in administrative positions. Several business processes were reengineered to facilitate investment processes to be taken by businesses. IT helped in this issue through implementing a workflow system to streamline processes over all departments. Each employee has access to a computer connected to the Internet and to the Ministry's Intranet. The Intranet fostered internal communication between the employees since it is fully used in many activities.

MOI undertakes a regular evaluation of the website; a detailed usage analysis is conducted monthly that summarises website access on all four languages such as, accessed sectors, accessed times, interested countries, times and durations of visits, etc. There is a continuous development of the website based on feedback received from users, and from the website's usage analysis. Future applications include sending newsletters, organising mail campaigns, enabling customisation of the website according to each user request, adding business matchmaking feature, publishing success stories, and offering recommendations for best location for new investments.

5.2.4 Case study 4 – A Public Hospital (PH)

The Public Hospital (PH) -founded in 1936- is among the hospitals that are part of the General Organisation for Teaching Hospitals and Institutes (GOTHI), which is one of the

seven entities that belong to the Egyptian Ministry of Health and Population (MOHP)[2]. GOTHI comprises 9 hospitals and 9 institutes. The main objectives of GOTHI are: (i) provide medical care to citizens according to the national health plan; (ii) educate and train new generations of physicians and students to fulfil citizens' needs in various specialisations; (iii) ensure the provision of the necessary funds for medical research to participate actively in solving medical problems; (iv) coordinate with other entities of MOHP, medical schools, and other research centres; and (v) apply the best and latest systems of proactive medicine, counter pollution, and preservation of environment.

PH is one of the largest public hospitals in Egypt. It serves a relatively large number of citizens, in part because it provides a large number of specialisations (24 units). Medical care is provided not only to patients who live in PH's geographic area, but extends beyond that as well.

Limited information about PH is provided at MOHP's website (http://www.mohp.gov.eg) under the section on GOTHI: the address of the hospital in addition to some pictures showing the different units of the hospital. Interaction with PH over the Internet is only through a general email of the Ministry. The number of computer users at PH is 36, mainly engaged in clerical work. The role of IT in the hospital is basically automating processes in some departments such as, accounting, inventory, purchasing, human resources, pharmacy etc. Computer users in each unit enter information about each patient but the main patients' data that physicians rely on are still in manual files. Monthly statistics are produced that summarise the total number of beds, number of patients in each unit, etc. Physicians rarely use computers because of several reasons explained in chapter 6 that provides analysis of the study findings. Internet connection is provided in only two places at the hospital: at the library and at the office of the Hospital Manager. PH departments are connected together via a local area network.

The information centre at the General Organisation for Teaching Hospitals and Institutes (GOTHI) provides technical maintenance to PH upon request. GOTHI tried several initiatives to connect the hospitals and institutes under its authority. For example, An

[2] In March 2009 a new ministry has been introduced to the governmental administration in Egypt: the Ministry of Population. Accordingly, the Ministry of Health (MOH) (previously the Ministry of Health and Population, MOHP) now concentrates on health issues only. However, MOHP will be used throughout the thesis for three reasons: first because the research was carried out in 2008, i.e., before this change occurred; second, all entities referred to or researched are still administratively part of the MOH; and third, the MOH's website name is still http://www.mohp.gov.eg

Intranet was established between all 18 hospitals and institutes, and physicians were offered the opportunity to have an email account. Unfortunately, both Intranet and emails are almost not used. GOTHI planned also to document all information relevant to each hospital and institute through distributing a questionnaire to each one, in an attempt to publish it at the organisation's website (http://gothi.gov.eg). Complete information about this issue is not available to date (searching information concerning PH in this website returns an "under construction" page). GOTHI intended also to implement a management hospital system instead of the one already installed, but was not successful due to its incompatibility with the nature of work at these hospitals and institutes.

Finally, it was essential to investigate the upper layer responsible of IT which dictated carrying out further research into the entity in charge on the level of Ministry of Health and Population (MOHP): The National Information Centre for Health and Population (NICHP). NICHP is considered the main source of medical information over all entities belonging to the Ministry. NICHP role is to coordinate between all information systems of the Ministry and its different authorities, and to allow access to medical information to all workers in the medical sector to improve work efficiency and to help in decision making. NICHP should perform a continuous review of IS progress worldwide, and apply suitable solutions that could best realise development in the Ministry and its belonging authorities.

Major changes took place since the inauguration of the new Minister of Health and Population in 2006 because of his perception about the importance of ICT in improving the health sector. Such interest in ICT was reflected in several initiatives and plans to incorporate ICT implementation in different areas: the Ministry's headquarter, different hospitals, and in medical units. This encouraged the Minister's IT Advisor to meet the researcher and to provide rich information about emerging achievements and future plans. For example, there is a plan to implement a medical care similar to the one in the UK, which provides primary medical care through medical units that exist in each district. 200 medical units out of 4000 have been computerised and connected to NICHP. Also, there is a plan to foster e-administration in the hospitals. Pilot projects in this plan started in 7 hospitals in order to be generalised in the future. Another plan is to undertake an overall survey of all hospitals and medical entities. A large phase of this plan was already concluded through compiling all hospitals data in 18 out of the 29 governorates of Egypt. The future plans comprise determining a national IT strategy in conjunction with international consultancy and IT companies. In addition, extensive study will be carried out to improve the website of the Ministry to include medical information and services of interest to citizens. Such plans required hiring new IT qualified experts (29 leaders and 5

assistants) offered high salaries provided from international grants. Unfortunately, hospitals and institutes belonging to GOTHI are not among the first priorities for the time being. Main reasons that hinder IT implementation from advancing in this sector in general and in PH in particular are presented in the next chapter that documents the research findings.

5.3 Data collection process

After deciding on the case studies to be investigated, the first stage of data collection was to meet top management in each organisation. Usually each meeting started by explaining the purpose of the research and the way it will be carried out, leading to obtaining their preliminary approval. It was then important to be acquainted with some basic information about the organisation such as an overview of the services offered to citizens, the role of IT, and the extent to which e-government program is implemented. Then a copy of the questionnaire was handed to be reviewed before management's final approval on distributing it. Further information was obtained through semi-structured interviews sometimes within the same meeting, or at separate occasions with other top management who can best provide the required information. The questions of these interviews are listed in appendix C.

Once the questionnaire was approved, the next step was to plan the distribution process with top management. Keeping the workflow uninterrupted in each organisation was among the top priorities of the researcher. It was preferred to assist employees while responding to the questionnaire for many reasons: (i) to explain the purpose of the research and the organisation of the questionnaire parts; (ii) to stress on the anonymous nature of the responses; (iii) to ensure that they understand each question clearly; (iv) to conduct interviews with some of the employees to understand more the working environment; (v) to ensure that the opinion of the employees does not contradict their answers to the questionnaire; and (vi) to understand the main problems that employees face in implementing IT. In some organisations, top management preferred that the researcher meets with the employees in groups in a conference room; in other cases, it was recommended to assist each employee in his office when it was difficult to interrupt his work.

Follow-up interviews were then conducted with top management to seek additional information to shed some light on any remaining unclear issues and to establish fulfilling answers to important points that arose during the previous data collection stage. These interviews were also an opportunity to the researcher to receive top management's

feedback on some of the questions that were posed to employees to compare notes, hence arriving at a full perspective.

Throughout the different phases of the data collection process the researcher had the opportunity to observe the work environment and the culture in each organisation. A detailed explanation of data collection process in each case is provided in the next sub sections.

5.3.1 Montaza District (MD)

Data collection at MD, Alexandria, started by contacting the district's Head by phone to present briefly the topic of the thesis and to set a meeting at his convenience. The first visit started by a meeting with MD's Head, followed by a tour to all departments to be acquainted by all information systems used and to understand the flow of information within the whole district. In each department, employees working on the systems demonstrated what they are doing and what were their future plans in improving IT in their departments. The researcher conducted also an interview with MD's Webmaster to investigate several issues related to the MD's website such as useful contents, most online services accesses, usage analysis reports, future plans, etc (questions about the website are included in appendix C). MD's Head expressed interest in doing an EGR assessment at the district because he needed to check the level of awareness of employees within the district. He asked for a copy of the questionnaire to review it first, and then to discuss the best way to start questionnaire distribution. After the Head went over the questionnaire, and exchanging views about it, he agreed to the researcher's suggestion to start with a pilot test to examine the relevance and comprehension of the different parts of the questionnaire to employees. The pilot test results led to some modifications in the structure and content of the questionnaire. Based on the pilot test, MD's Head and the researcher concluded that the best way to gather data would be to assist the employees while responding to the questionnaire to clarify any ambiguities (a full description of the pilot test was presented in chapter 3, section 3.5.2).

The actual data collection phase of the questionnaire was conducted through reading each question to a group of 10 to 15 employees, and asking them to mark on the answer that fitted best from their point of view. The IT Manager and Webmaster – who went over the questionnaire earlier – organised the whole procedure to make it as smooth and efficient as possible. After terminating the questionnaire distribution phase, two follow-up interviews were conducted, one with the MD's Head, and the other with the IT Manager.

5.3.2 Tax Unit for Non-Commercial Professions (TUNC)

At the outset, an interview was conducted with the Webmaster at the central administration of the Egyptian Tax Authority (ETA). The Webmaster handles all communications with citizens accessing ETA's online services. The main purpose of the interview was to understand the general process and the electronic communication between the central administration and all tax units. A next meeting was carried out with TUNC's Head to introduce the research topic and to discuss how the e-government program was planned for and implemented at the unit. The meeting revealed that decisions related to IT are not the responsibility of the Head; the information centre at the central administration sets the strategy and means to implement it at all units. The researcher therefore decided to investigate the overall e-government strategy with the IT Manager at the central administration, and to consider TUNC's Head among the questionnaire's responders.

The Head reviewed the questionnaire first, and was willing to cooperate and support. He suggested that the best way to undertake the survey would be through arranging the whole process with the IT Manager of the unit. It was then an opportunity to interview the TUNC's IT Manager to understand how IT is used at TUNC, the challenges they face, and the information flow within the unit. Information from the interview ascertained the fact that the unit was executing a plan set by the central administration, and that IT responsibles at TUNC were not acquainted with many details related to the entire e-government program. Most questionnaire responses were gathered through meeting employees in groups of around 10 each. Sometimes it was crucial to meet senior management at their offices due to their limited free time. While responding to the questionnaire, many employees, surprisingly, revealed that they were totally unaware that ETA provides online services for citizens allowing financiers to present their income statements over the Internet. The data collection phase of the questionnaire was interrupted several times because the work environment was very unstable, and management were faced continuously with new rules and decisions. They requested to halt the questionnaire distribution process several times having to meet challenging deadlines set by central administration.

After completing this phase, a very challenging task was to meet the IT Manager of ETA. His tight schedule proved to be a hurdle; however, a meeting was possible after several attempts. The interview lasted three hours and was very useful since it highlighted many points related to e-government strategy at the authority as a whole, achievements, challenges, and future plans. A later meeting was undertaken with both the Webmaster and the General Manager of Systems and Software to obtain further information about

provided online services, and the new systems designed to be aligned with the continuous changes in the tax laws. After the questionnaire analysis was completed, two follow-up meetings took place with TUNC's Head and IT Manager to clarify any missing points or inquiries.

5.3.3 Ministry of Investment (MOI)

Data collection started by requesting a meeting with the IT Consultant of the Minister. The interview was mainly about discussing the importance of IT usage at MOI, and how e-government program is an integral part of the business objectives of the Ministry. A large part of the interview time was spent in analysing the official website of the Ministry highlighting its main advantages and weak points, and the features and services to be provided in the near future. Upon explaining the need to distribute a questionnaire to the employees, the IT Consultant expressed doubts about the possibility to carry out such process because the majority of employees hold senior positions (140 out of 200 of the total number of employees at the Ministry), and their schedule is very busy. It was then decided to spend no more than 30 minutes at each employee's office without interrupting their regular routine. The fact that the majority of the respondents hold senior management positions facilitated responding to the questionnaire because they did not need any explanation or clarification. After analysing the data collected from the questionnaire, it was important to conduct two follow-up interviews with the IT Consultant and his assistant to compare their views with those of the respondents, and to request further clarifications in some issues raised by the respondents.

5.3.4 Public Hospital (PH)

Before starting data collection, it was important to call the Head of the information centre of PH to enquire about the IT status at the hospital to ensure the existence and usage of computers and software systems. After demonstrating the study to be performed to the information centre Head, he requested a copy of the questionnaire to be presented to PH Manager for approval. Collecting data was postponed for several weeks because the management was always under lots of pressure having had to be involved in sorting out problems the hospital faced during this period. During that time, the researcher pursued a parallel approach by investigating the probability of conducting the study at other hospitals in case PH would not be available. Finally, PH Manager agreed on the questionnaire content and approved to carry out the research on a condition to keep the name of the hospital anonymous.

The first phase in collecting data started by visiting PH's information centre to conduct an interview with the centre's Head. What was surprising that it is almost the default that a

physician is the Head of the information centre at any public hospital. The Head revealed that he has started this position since two weeks only and that he neither had enough details about the existence of an e-government program, nor an exact idea about the software applications at PH and their efficiency levels. The researcher tried then to interview two employees who have been working for several years at the centre, but their knowledge was limited to the execution of the software applications that were installed earlier. Since several issues were still unclear about IT strategy and future plans, there was a need to request an interview with the former Head of the information centre. After ensuring that there was no clear vision about e-government or IT in general at the hospital, it was concluded that further research should be undertaken with responsibles of the information centre at the General Organisation for Teaching Hospitals and Institutes (GOTHI) - to which PH belongs - to find answers to several questions listed at the content of the interview in appendix C.

Information gathered from the interviews with information centre responsibles at PH showed that the role of IT at PH is limited to the automation of some of the procedures at various departments of the hospital. Furthermore, it showed that not only physicians do not use computers, but also do not rely seriously on information accessed from computers' databases. Administrative staffs are the only computer users among employees, and their work is simply entering basic information about patients in each department, or data related to accounting, payroll, inventory, or medicines in PH's pharmacy. The agreement was then to start distributing the questionnaire on the employees any day but from 10 a.m. to 2 p.m. only. During the next three visits, employees responded to the questionnaire in groups of four or five, but the rest of the employees who could not leave their workplaces, replied to the questionnaire at their offices with the assistance of the researcher. Some of the employees felt very uncomfortable in filling the questionnaire especially that their direct management tried to prevent them from replying. Further assurance (from the part of the researcher and the information centre's Head) was given to them and to their management that PH Manager approved the whole process. To encourage them to express freely their point of view, the researcher stressed on the anonymous nature of the questionnaire. Since some computer users are the sole users of computers in their departments, some of them preferred to keep the name of their department out.

The main observation derived during the questionnaire distribution phase was that most employees are not aware of several issues such as, the importance of IT, the meaning of e-government and strategy, the existence of any website that provides any information

about PH or the Ministry in general, etc. This was due to their limited education level and skills because they did not attend organised training sessions.

At the same time, a meeting took place at the information centre at GOTHI to meet the Head and her assistant. They both ascertained that they don't have any idea about IT strategy in the health sector because they are not involved in any plans set by the Ministry of Health and Population (MOHP). Despite this fact, they are still making several attempts and suggesting some initiatives, but unfortunately without realising true success. This could be attributed to many reasons: the absence of a clear strategy due to their limited management skills, difficulty to allocate budget for them, and absence of power that allow them to enforce IT policies and procedures in all hospitals and institutes under the control of GOTHI. It was obvious that GOTHI provides basic technical maintenance to these hospitals and institutes. The last stage in data collection was to meet the IT Advisor of the Minister because he is the main player in shaping IT strategy at MOHP. During the two meetings held with the IT Advisor, answers to all inquiries were provided, and he expressed interest in conducting the same research in other hospitals in which implementation of e-government programs has just started (possible subject for further research or paper).

5.4 Comparison of data collection in the four case studies

After collecting data from the four case studies, it was essential to evaluate the entire data collection process and compare it among the four organisations. Table 5.1 classifies each case study into the following: contacts, size of sample, usefulness of the collected data, and its relevance to the hypotheses and to the overall thesis. As shown in table 5.1, the highest numbers of visits and contacts were at TUNC and PH because at both case studies there was a need to go to higher authorities outside the organisations responsible for decision making of e-government and IT. These organisations were among other organisations implementing a wide strategy set by the Egyptian Authority Administration (ETA) in case of TUNC, and by the Ministry of Health and Population (MOHP) in case of PH. In terms of usefulness of each case study to the thesis, the table shows that data collections at MD and TUNC were the most useful ones because the sample size is higher than in MOI and PH. Small sample size could have affected the relations between the different dimensions of the framework. In case of PH, data gathered was not very useful because many employees found it very difficult to understand several parts of the questionnaire, and because they were reluctant to note any negative perceptions.

Concerning the relevance of the data to the hypotheses set before the empirical study, data obtained from the first three cases was relevant, in contrast with data collected from

the fourth case, PH. Such irrelevancy was a result of the responses obtained under the technology dimension (Part C of the questionnaire listed at appendix B) concerning employees' feedback about the quality of the organisation's website. This made the case not quite aligned with this part due to the fact that most respondents at PH did not know that there is an existence of the hospital over the Internet, which made them unable to evaluate the website. Another reason of this deficiency was because online information about PH is trivial and exists as part of the website of MOHP and not in a separate website representing the hospital. As a consequence the importance of website's quality on affecting the technology dimension could have been under-estimated.

	Time	Contacts	Size of sample	Usefulness	Relevance to thesis/hypotheses
Montaza District (MD)	2006 6 visits	Head IT Manager Webmaster	81	Extremely useful	Extremely relevant
Tax Unit for Non-Commercial Professions (TUNC)	2007 10 visits	ETA Webmaster TUNC Head TUNC IT Manager ETA IT Advisor	55	Extremely useful	Extremely relevant
Ministry of Investment (MOI)	2006 7 visits	Minister's IT Consultant Executive IT Manager	48	Useful	Extremely relevant
Public Hospital (PH)	2008 11 visits	PH Info. Centre Head PH Info. Centre Ex. Head 2 Seniors at PH Info. Centre GOTHI Info. Centre Head GOTHI Vice Info. Centre Head MOHP IT Advisor	36	Quite useful	Quite relevant

Table 5.1 – Comparison of Data Collection at the Four Case Studies of Public Organisations

5.5 Main remarks on data collection

Conducting research in the four case studies provided a vast and rich experience in terms of data collection and of issues related to EGR. The most important issue that had a positive effect on collecting data from the questionnaire instrument was assisting respondents as much as possible while answering it. Such approach helped in ensuring that employees understood well every part of the questionnaire. It created also opportunities to listen to employees and to encourage them to express their views regarding some of the same matters raised in the questionnaire. Usually employees are reluctant to express negative views in formal surveys.

Although it was difficult to find employees willing to respond to a long questionnaire, which moreover included parts that required sometimes further explanations; having obtained the approval of top management in the public sector facilitated this task due to the bureaucracy nature of the public sector. Employees follow the instructions once set by top management.

Making a tour over all departments in each organisation allowed the researcher to observe the working environment. This helped in being acquainted with the nature of work and processes in each department, and in understanding the flow of information and how ICT was used within the organisation and between the organisation and other public entities.

The most challenging task was to request interviews with top management in each organisation. Due to their tight schedule, it was very hard to allocate time for researchers especially that some of them did not perceive the value of research in improving their work.

Interviewing employees and observing the workplace revealed that most employees were not motivated and were usually unaware of any plans related to ICT development within their organisations. Such behaviour evidently affected their willingness to use ICT efficiently, and to cope with any changes in their work resulting from e-government implementation. Few people (and sometimes only one person) were aware of the whole picture. The researcher noticed also the wide difference in the level of knowledge between public organisation, and even within the same organisation. Furthermore, the attitude of employees was not the same within the same organisations and under the same circumstances; some employees were willing to learn and to work hard, others acted in a totally opposite behaviour.

Upon completing the data collection phase, the researcher was able to recognise the main problems that exist in the public sector in Egypt (that affect consequently e-government implementation). Such problems could be summarised into the following:

- Corruption: making some employees unwilling to use ICT in each organisation because this would impose more control on their work.

- Lack of integration: because the culture in the public sector does not encourage collaboration between employees, it is quite a challenge to implement IS systems that help integration of information between departments, and streamlining of processes among departments.

- Bureaucracy: due to the rigid nature of the public sector, sometimes deciding ICT implementation is hindered by inefficient or inadequate rules. Also, this inflexibility de-motivates qualified people from getting the rewards they deserve for their skills and hard work, and which would pose a risk on their continuing enthusiasm about learning new systems.

- Shortage of Funds: limited budget in the public sector results in allocating low salaries causing competent personnel to resign and work in more rewarding places

- Absence of sustainability: usually IS projects start with great high hopes and interest from the part of top management, but once the first implementation stages are concluded, projects do not get the same attention and support later (Hosni, 2002). This leads to a partial or sometimes a total failure of many projects.

- Unilateral decision making: usually top management decide the systems to be implemented without referring to employees working in their organisations. Since employees are the parties with the highest awareness of the business processes, sometimes the systems developed are not fully compatible with the workflow in the organisation. Moreover, since employees were not involved in the decision process, they feel isolated and do not consider themselves as part of the project.

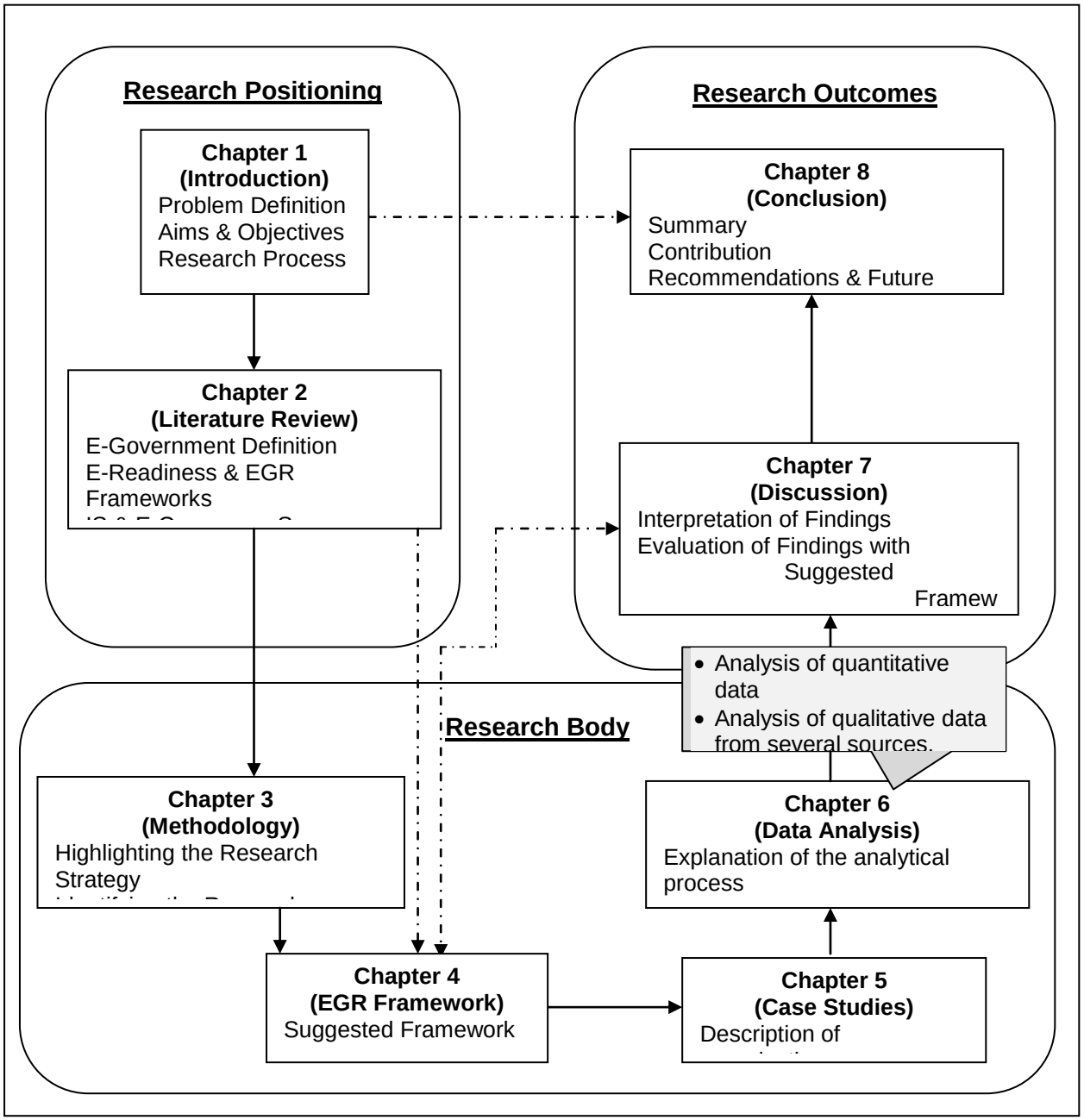
5.6 Summary

This chapter highlighted the national e-government project of Egypt. It described also the context of each of the four public organisations selected as case studies for assessing EGR of public organisations in Egypt. Next, the chapter explained how data was collected from each case study, and set a comparison between data gathering process in each one reflecting the view of the researcher, and the experience obtained from such process. The next chapter will show a complete analysis of the different types of data obtained from these four organisations.

6. Data Analysis

Objectives of chapter 6

- Summarise the overall process of data analysis.
- Present the findings of the quantitative data.
- Demonstrate the results of the qualitative data gathered from different sources of



The previous chapter described the context of the study by first presenting an overview of the e-government program in Egypt and the relationship between the national e-government strategy and the research topic. Second, the chapter provided a detailed description of each of the four case studies selected for representing public organisations

in Egypt, followed by a demonstration of the data collection process undertaken in each organisation. Finally, the chapter presented a comparison of the data collection process between the four organisations, ending by a summary reflecting the researcher view with regard to the entire process. This chapter starts by reporting the findings of the four case studies to verify to which extent they abide to the framework suggested in the beginning. The results of the quantitative data (gathered from distributing a questionnaire to the employees in each organisation) of each of the four case studies are presented and compared, in addition to the aggregated quantitative data of these cases, to provide a complete picture of EGR in Egypt. Quantitative data analysis was then followed by an analysis of the qualitative data obtained from a number of sources: interviews, documentation, archival records, and observations. The objectives were to: (i) compare both kinds of data for the purpose of triangulation to verify the extent to which the empirical research reflects the proposed framework that was derived from the literature; and (ii) present a framework to assess EGR of public organisations in Egypt.

6.1 Findings of quantitative data

Quantitative results are listed under two sections: demographics and testing research model. Demographics comprise a table describing samples in the four cases (table 6.1), and another table comparing software usage and training (table 6.2). Testing the research model was performed first on each of the four case studies that are compared together, then on combined data from these cases. Comparing research model in each of the four case studies starts by presenting a table containing means of the 5 dimensions of the framework: strategy, processes, technology, people, EGR (table 6.3), followed by a table illustrating the partial model results that show the relationships between these dimensions (table 6.4). Finally, testing the research model of the four cases combined (i.e., over the entire country) presents the means of the framework's components (table 6.5), and the relationships between the same dimensions (table 6.6).

6.1.1 Demographics

Table 6.1 shows that the response rates in all cases are high (above 87%). Invalid responses were discarded because they were incomplete due to three reasons: (i) the first section concerning the strategy dimension was difficult for the employees to reply to, because most of them did not have a complete idea about all the issues stated under it. Some of them left this section because they could not perceive its relevance to them; (ii) the length of the questionnaire (consisting of 11 pages) discouraged some employees from completing it, they just filled the first few pages then lost enthusiasm; and (iii) the fear to express negative perception towards some issues raised in the questionnaire.

Comparing the samples in the four cases revealed that the percentage of females is high at MD (84.5%) and PH (88.2%) in contrast with TUNC and MOI where both genders are almost equally distributed. As for the education level, the highest percentage of post-graduate employees is at MOI because a large number of employees at MOI are in senior positions (140 out of 200 employees). Employees at MOI and TUNC are highly educated compared to employees at MD and PH because all at MOI and the majority at TUNC (94%) have completed a four-year college education. Such fact would definitely have an effect on the people dimension of the research framework, especially on the different skills of employees and on their willingness and ability to use computers.

IT Experience is almost the same at MD and TUNC (6 and 5 years respectively), but is higher at MOI and PH (10 and 8.7 years respectively). Working hours per week are more at TUNC and MOI (45 and 50 hours respectively) compared to MD and PH (35.6 and 36.9 hours respectively) because old public organisations abide more to the government common working hours which are 6 hours per day.

Highest time in using IT is at MD and PH (80% in both) because employees at these organisations use computers mainly in data operations. IT use time at MOI is also high (78%) because: (i) all employees have access to Internet and email; (ii) being highly educated and the majority in senior positions, employees rely on computers for analysis of strategic data; and (iii) some of the respondents were from the IT department spending all their working times on computers in software development, networking and security, software and hardware maintenance, website management, or publications and editorials. TUNC's employees use computers only 53% of their working time; they are more occupied in operations and in interaction with financiers, and not only in data entry as MD and PH. Since employees at TUNC spend considerable time in supporting customers, the effect of the customer service skill under the people dimension of the research framework would be obvious.

Concerning IT skills, respondents at MOI expressed their high abilities in using computers, Internet, and email; while respondents at MD, TUNC, and PH rated their personal computers skills above average in contrast with their low average skills in using both Internet and email. As for access to technology, all employees at MOI have access to computers, Internet, and emails; while around 80% of respondents at MD and TUNC have access to computers as opposed to a relatively low percentage having access to the Internet (around 20%) or email (around 10%). PH employees, although all of them have access to computers, only a small percentage has access to Internet or email (8.8% and 5.8% respectively).

When investigating usage and training, results showed that the highest usage of all software applications is at MOI, and that software training and usage in the four case studies is mainly on Microsoft Word followed by Microsoft Excel. Findings show clearly the high percentage of employees who use and took training on Microsoft PowerPoint at MOI compared to the other three other organisations. As for the required training, the primary choice of the respondents at MD is Microsoft PowerPoint (94.4%), Microsoft Excel at TUNC (42.9%), Geographic Information System (GIS) at MOI (33.3%), and Project Management at PH (44.1%). Table 6.2 shows the software mostly used, the most training courses provided as well as the most training courses requested by employees in each case.

	Montaza District (MD)	**Tax Unit for Non-Commercial Professions (TUNC)**	**Ministry of Investment (MOI)**	**Public Hospital (PH)**
Sample	No. of prospect respondents: 140 No. of respondents: 81 Invalid responses: 10 Response rate: 87.6%	No. of prospect respondents: 70 No. of respondents: 55 Invalid responses: 6 Response rate: 89%	No. of prospect respondents: 200 No. of respondents: 48 Invalid responses: 3 Response rate: 93.8%	No. of prospect respondents: 36 No. of respondents: 36 Invalid responses: 2 Response rate: 94.4%
Gender	Female: 84.5%	Female: 51%	Female: 47%	Female: 88.2%
Highest Age Range	From 20-30: 45%	From 31-40: 38%	From 31-40: 61%	From 20-30: 58.8%
Education	Post graduates: 4.2% Four-year college degree: 45.1% High Technical Institute: 47.9%	Post graduates: 2% Four-year college degree: 93.9% High Technical Institute: 2%	Post graduates: 15.6% Four-year college degree: 84.4%	Post graduates: 2.9% Four-year college degree: 52.9% High Technical Institute: 44.1%
Average IT Experience	6 years	5 years	10 years	8.7 years
Managerial Positions	18%	33%	49%	14.7%
Working Hours/week	35.6 (5.9 hrs/day – 6 days/wk)	45 (9 hrs/day – 5 days/wk)	50 (8.3 hrs/day – 6 days/wk)	36.9 (6.2 hrs/day – 6 days/wk)
Use of IT/Working Time	80%	53%	78%	80%

Table 6.1: Description of the Sample Used at MD, TUNC, MOI, and PH

	Montaza District (MD)	**Tax Unit for Non-Commercial Professions (TUNC)**	**Ministry of Investment (MOI)**	**Public Hospital (PH)**
Use of Word/Excel	Word: 88.7% Excel: 52.1% PowerPoint: 15.5 Project Management: 4.2% GIS: 4.2% Access: 19.7%	Word: 63.3% Excel: 55.1% PowerPoint: 16.3% Project Management: 2% GIS: 4.1% Access: 10.2%	Word: 100% Excel: 100% PowerPoint: 93.3% Project Management: 11.1% GIS: 8.9% Access: 55.6%	Word: 100% Excel: 90% PowerPoint: 4% Project Management: 0% GIS: 0% Access: 20.6%
Training Attended	Word:70.4% Excel: 43.7% PowerPoint: 19.7% Project Management: 2.8% GIS: 2.8% Access: 16.9%	Word: 69.4% Excel: 51% PowerPoint: 14.3% Project Management: 6.1% GIS: 6.1% Access: 10.2%	Word:71.1% Excel: 77.8% PowerPoint: 51.1% Project Management: 0% GIS: 0% Access: 40%	Word: 85.3% Excel: 73.5% PowerPoint: 29.4% Project Management: 0% GIS: 0% Access: 35.3%
Training Needed	Word:70.4% Excel: 83.1%	Word: 26.5% Excel: 42.9%	Word: 0% Excel: 0%	Word:23.5% Excel: 29.4%

	Power Point: 94.4% Project Management: 46.5% GIS: 43.7% Access: 54.9%	Power Point: 38.8% Project Management: 30.6% GIS: 28.6% Access:40.8%	Power Point: 13.3% Project Management: 17.8% GIS: 33.3% Access: 20%	Power Point: 35.3% Project Management: 44.1% GIS: 41.2% Access: 41.2%

Table 6.2: Software Usage and Training at MD, TUNC, MOI, and PH

6.1.2 Testing research model

Comparison between case studies

Investigating employees' knowledge regarding the four dimensions of the proposed research model: strategy, processes, technology, and people, and their perception towards E-Government Readiness (EGR) in each case revealed that many employees are unaware of many issues related to IT strategy at MD, TUNC, and PH. Table 6.3 presents the four dimensions and the level of EGR, their corresponding: scales, average scores, Standard Deviation (SD) values, and results of ANOVA t-test for the comparison between the means of these variables in all four organisations. The results obtained prove that there is no statistically significant difference between the four case studies.

Group / Construct	Scale 1 to 7	MD (n = 71)		TUNC (n = 49)		MOI (n=45)		PH (n=34)		*P*-value
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Strategy	Strongly disagree to Strongly agree	5.9	0.6	5.3	1.4	5.5	1.1	5.1	0.8	**0.487**
Process		5.3	1.1	4.8	1.5	5.1	0.9	5	1.2	**0.538**
Technology	Far short of expectations to Greatly exceeds expectations	5	1.2	4.8	1.4	5.2	1.4	5.4	1.3	**0.389**
People	1st Section: Strongly disagree to Strongly agree 2nd Section: Far short of expectations to Greatly exceeds expectations	5.2	1.1	5.3	1.3	5.3	1.7	5	1.2	**0.631**
EGR	Extremely unready to Extremely ready	5.95	2.1	5	1.5	4.9	1.2	4.5	1.1	**0.063**

Table 6.3: Comparison of the Average of the Four Dimensions between MD, TUNC, MOI, and PH

Testing the research model in each case study was performed following the four following steps: a) carry out a factor analysis to extract and group dimensions in each construct, b) test multi-collinearity among constructs in each dimension, 3) check reliability and validity of the model, and 4) test the partial models. Detailed explanation of these four steps is provided in chapter 3, section 3.7.1.

a. Factor Analysis

Appendix D shows the final factor analysis of each dimension in each case study. The selection criteria of the factors used are based on retaining the factors that adhere to the rule: a loading number greater than 0.5 on one column, and less than 0.5 on all other columns (Hair et al., 1998). Examining the final factor analysis in each of the four dimensions in each case study revealed that the affecting factors (or constructs) and their categorisation within the same dimension differ from a case to another. Such results show that the strength and classification of each group of constructs depend on the context of each organisation, and on the perception of employees towards the constructs under each dimension. As an example, considering the strategy dimension in each case study, the most affecting factor is: (i) promoting e-government at MD; (ii) role and value on each stakeholder at TUNC; (iii) existence of policies and procedures at MOI; and (iv) leadership at PH.

b. Degree of Multi-collinearity

Correlation tests show that all construct pairs are not highly correlated (see appendix E). All pair correlation values are less than 0.75, proving the absence of multi-collinearity, which is not recommended (explained in chapter 3, section 3.7.1).

c. Reliability and Validity

Assessment of the reliability of the model showed that all alpha coefficients exceed 0.80, indicating a high level of internal consistency or homogeneity among the constructs under each dimension (see appendix F).

Convergent validity was also checked to ensure the extent to which each group of constructs indicates the same item as well as the degree of compatibility of multiple measures within the same dimension. Appendix G shows that all correlations between constructs in each dimension are higher than 0.568, ranging from 0,568 to 0.996 proving the existence of convergent validity.

d. Partial Models

Relations between the different dimensions of the model are presented in table 6.4. Also, graphical illustration of these models is showed in appendix H.

Findings showed that the research hypotheses were confirmed in all four cases. Relations concerning the people dimension cause high effects whether people is a dependent variable affected by strategy (H5c), or an independent variable affecting EGR (H4). Also, the impact of processes on EGR (H2) is high in all cases.

The differences between cases lie in hypotheses H1, H3, H5a, and H5b (highlighted rows in table 6.4). PH has always weaker relationship than the other three cases. Findings revealed also that the weakest relationship in all cases is in the effect of strategy on processes (H5a); it has a modest impact at TUNC and MOI, and weak impact at MD and PH.

	Montaza District (MD)			Tax Unit for Non-Commercial Professions (TUNC)			Ministry of Investment (MOI)			Public Hospital (PH)		
Hypothesis	**P-Value**	**Significance**	**Result**	**P-Value**	**Significance**	**Result**	**P-Value**	**Significance**	**Result**	**P-Value**	**Significance**	**Result**
H1 Strategy→EGR	0.44116	Modest impact	Accepted	0.84327	High impact	Accepted	0.90053	High impact	Accepted	0.28628	Weak impact	Accepted
H2 Processes→EGR	0.87330	High impact	Accepted	0.91212	High impact	Accepted	0.91147	High impact	Accepted	0.90320	High impact	Accepted
H3 Technology→EGR	0.65767	High impact	Accepted	0.88856	High impact	Accepted	0.92069	High impact	Accepted	0.40072	Modest impact	Accepted
H4 People→EGR	1.00000	High impact	Accepted	0.90125	High impact	Accepted	0.90006	High impact	Accepted	0.88978	High impact	Accepted
H5a Strategy→Processes	0.16749	Weak impact	Accepted	0.41201	Modest impact	Accepted	0.50834	Modest impact	Accepted	0.32774	Weak impact	Accepted
H5b Strategy→Technology	0.54218	Modest impact	Accepted	0.41274	Modest impact	Accepted	0.54732	Modest impact	Accepted	0.33819	Weak impact	Accepted
H5c Strategy→People	0.82310	High impact	Accepted	0.85100	High impact	Accepted	0.88645	High impact	Accepted	0.84369	High impact	Accepted

Table 6.4 – Partial Research Model Results (Rows showing different results in both cases are highlighted)

Aggregation of the four case studies - Egypt

The last step in the quantitative analysis was to test the research model on the overall country. The same analysis was undertaken on the entire data of the four cases. The objective was to provide an assessment of EGR of public organisations in Egypt verifying the effect of the four dimensions: strategy, processes, technology, and people on EGR. Checking the means of each of the four dimensions in addition to EGR showed that all means range from 5 to 5.1 (see table 6.5).

	Scale 1 to 7	**All Cases (n = 199)**	
		Mean	**SD**
Strategy	Strongly disagree to Strongly agree	5.44	1.2
Processes		5	1
Technology	Far short of expectations to Greatly exceeds expectations	5.1	1.1
People	1st Section: Strongly disagree to Strongly agree 2nd Section: Far short of expectations to Greatly exceeds expectations	5.2	1
EGR	Extremely unready to Extremely ready	5.1	1.3

Table 6.5: Average of the Four Dimensions for all Cases Combined

The same steps followed in testing each case study were performed on the combined data: 1) carry out a factor analysis to extract and group dimensions in each construct, 2) test multi-collinearity among these dimensions to determine the strength of the relationship between them, 3) check reliability and validity of the model, and 4) test the partial models.

Appendix I includes the findings about Egypt. It contains the initial factor analysis leading to the final factor analysis (after suppressing some factors and conducting the factor analysis another time to see the final effect of each factor after data reduction). The factors extracted and stated in the final factor analysis were those that adhere to the rule that retains only the factors having a loading number greater than 0.5 on one column, and

less than 0.5 on all other columns. For example, in the strategy dimension, the factors: "Strategic Alignment 2", "Internal Funding", and "Identification of Stakeholders" were suppressed after conducting the initial factor analysis. Appendix I contains also the correlations between the extracted groups of constructs, reliability and convergent validity test results, and the partial models that show the relationships between the dimensions of the model.

The correlations between each group of constructs are all less than 0.6, which proves that they are not highly correlated, avoiding the problems of the existence of a high degree of multi-collinearity. Also, reliability of the instrument is high since all alpha coefficients exceed 0.9. Convergent validity was also realised because all correlations between constructs in each dimension are higher than 0.6, ranging from 0.637 to 0.986.

Table 6.6 – Partial Research Model Results for Egypt

	Egypt		
Hypothesis	**P-Value**	**Significance**	**Result**
H1 Strategy→EGR	0.39749	Modest impact	Accepted
H2 Processes→EGR	0.91003	High impact	Accepted
H3 Technology→EGR	0.96958	High impact	Accepted
H4 People→EGR	0.92781	High impact	Accepted
H5a Strategy→Processes	0.45294	Modest impact	Accepted
H5b Strategy→Technology	0.51472	Modest impact	Accepted
H5c Strategy→People	0.90532	High impact	Accepted

As for the partial relationships between the different dimensions of the framework, findings confirmed all seven hypotheses set in the research framework (see table 6.6). The three dimensions: processes, technology, and people have a high impact on EGR; whereas strategy has a modest impact on EGR. Regarding the effect of strategy on the three dimensions: processes, technology, and people; findings revealed that strategy has a modest impact on processes and technology, and a high impact on people.

6.2 Findings of qualitative data

In each case study, findings of interviews with top management are demonstrated first, followed by the findings obtained from other sources: documents, archival records, and observation of the workplace.

The steps undertaken in analysing quantitative data (as shown in chapter 3: Methodology, section 3.7.2) started by documenting the data obtained from interviews with top management, documentation, archival records, and observations of the workplace. The researcher focused then on the information applicable to the study. Finally, each piece of information was examined to compare its relevance with the seven research hypotheses extracted from the literature. To clarify the later step, examining the first sentence in the interviews conducted with top management at MD "The main motives that led to the implementation of e-government at the district were to fight corruption and bureaucracy" was translated to the first hypothesis (H1) investigating the effect of strategy on EGR through looking at the "motives" component in the strategy dimension. All subsequent information of qualitative data in each of the four organisations researched was analysed following the same approach.

6.2.1 Montaza District (MD)

a. Interview with Head, IT Manager, and Webmaster of MD

The main motives that led to the implementation of e-government at the district were to fight corruption and bureaucracy through providing a separation between citizens requesting services from the district and employees delivering them. Furthermore, management aimed to facilitate service delivery for citizens by saving them time, money, and effort. The strategy and action plan of the e-government program of the district was part of the national e-government strategy and action plan concerned with modernising the public sector through the use of ICT. In addition, applying ICT was expected to play an important role in imposing more control and accountability on employees.

The first step in implementing e-government at MD was to review and adjust (or even re-engineer) business processes in each department to avoid any redundancy or duplication of work, hence streamlining them over all departments. The next step was to set the required policies to ensure the implementation of the re-adjusted business processes throughout the whole district. The system goes then through a continuous evaluation to spot deficiencies and room for improvements, and to perform further alterations accordingly. As a consequence, waiting periods for the delivery of some services was

eliminated and such services were offered on instant basis, i.e. requiring less than 30 minutes to be accomplished.

One of the main factors that helped in the success of e-government at MD was in carrying out an employee skill evaluation leading to a reallocation based on putting each employee at the position that best fits his qualifications. The most notable change was in placing senior employees, specifically those who were characterised by their rigid culture and difficulty to adapt to change, at the back office, and in bringing instead junior employees at the front office after acquiring the appropriate training. This realised an improvement in the services provided to citizens through presenting a more suited interface for the public. Yet, compared to the high awareness of policy makers regarding the value e-government can realise, employees at senior, middle management, and non-management positions definitely need more insight about such value.

There is a continuous monitoring and evaluation in several areas: (i) revising services to simplify the procedures; (ii) monitoring the entire workflow through producing an aggregated weekly report to be presented to the MD Head. The report contains all services requested by citizens and their present status. The Head can check the completed services and investigate the reasons behind pending ones; and (iii) reviewing and updating the district's website daily and discussing ways to improve it. The monthly usage analysis report - that monitors all website activities – serves towards the website's improvement as well. The website gives the opportunity for citizens to present their feedback about offline and online services. MD head is always interested in getting the opinion of citizens regarding the usefulness and usability of the website, and their suggestions for improvements. There is also a mailbox at the district's entrance for physical complaints and suggestions.

The main challenges facing e-government implementation are the culture and skills of employees. The skills of employees are limited because some of them do not hold a university degree, and at high school or technical college level (2 years after high school) the acquired skills are in general handicapped compared to the labour market requirements. Also, as a national employment policy, some employees could be hired without matching their educational background and other credentials with the district's needs. The culture of the employees impedes the incorporation of changes because some do not possess the flexibility to change their approach to work, and are not willing or capable of improving their skills. Another obstacle to e-government progress is the difficulty in communicating with other governmental agencies and the lack of integration of

ICT systems between MD and such agencies. This prevents providing online services covering multiple agencies.

The software applications developed are not completely congruent with the business processes at the district. This is attributed to the fact that these systems were approved by the responsibles of the "modernising the public sector of the national e-government program". Municipalities were certainly involved at the beginning to explain their needs, but they did not participate in the decision making process. As a result, sometimes the software applications do not provide the employees with their requirements limiting the efficiency of producing, digitising, and distributing information at MD. To overcome this deficiency, management tried to develop in-house software systems to complement the existing ones.

MD has undertaken several advancements in e-government but is still not completely ready. The success of e-government project depends mainly on the participations of both citizens and employees. Also, it is very important to motivate employees through granting them incentives based on their achievements. This can be monitored electronically by designing software systems dedicated specially for this purpose. As for the priority of the four dimensions affecting EGR at MD, the most important factor is people, followed by strategy, processes, and finally technology.

b. Other sources of evidence

Looking at the district's structure showed that some positions changed due to e-government implementation. Senior employees who were dealing with citizens were moved to the back office and replaced by junior ones. Employees responsible for ICT are now reporting directly to MD Head. In addition, several business processes have changed, especially those related to simplifying the service procedure. Business processes are clearly defined and streamlined in order to transform many services into instant ones (taking less than 30 minutes), and to accelerate the lifecycle time of other services. The time that each service takes was also defined. In addition, IT policies and procedures were determined to impose control and accountability.

The archival records included the monthly usage analysis report that detects all activities performed through the website. The report includes important statistics such as, requested services and the entities responsible for that service at MD and the procedures taken to respond to it, page views, complains. The report contains also a detailed analysis of the users accessing the website such as first or return visitors, demographics, time spent by each visitor, etc. There was also an opportunity to look at the training courses

that employees attended. These courses cover all their needs and include Microsoft Office programs, hardware maintenance, software development, and networking. Other archival records included citizens' comments and suggestions for improving the website of the district.

Spending several days at MD allowed the researcher to note several issues; employees at the front desk are well trained on dealing with citizens and treating them as customers. Despite the rigid nature of the public sector that restricts rewarding qualified employees, management was able to motivate them through other ways such as, involving them in decision making, giving them positive feedback on their work, promoting MD e-government initiative through other public entities, and applying for national competitions. Young employees were encouraged to develop new ideas that could solve problems or realise improvement. It was also very easy for these employees to communicate with the Head whenever they have suggestions or inquiries. Software systems developed in-house were examined to see their efficiency in complementing and integrating with the software applications installed earlier. The incomplete automation of the internal workflow and the lack of integration of ICT with other agencies forces employees working on computers to enter data twice: manually and on the computers, which constitutes an extra workload for them. Unfortunately, qualified employees constitute a small percentage at MD; most employees are not competent enough and cannot easily change their working style. In addition, while assisting employees in responding to the questionnaire, a large number of them revealed that they are not acquainted with several issues related to the IT strategy. Some of them were even unaware of its existence.

6.2.2 Tax Unit for Non-Commercial Professions (TUNC)

a. Interview with IT Manager and Webmaster of Egyptian Tax Authority (ETA)

E-government project at TUNC started as part of implementing e-government at the Egyptian Tax Authority (ETA). E-government at ETA was a vital requirement from the Ministry of State for Administrative Developments (MSAD), responsible for implementing the national e-government program. Enabling citizens to present and pay their income statement over the Internet was possible through including such service at the national e-government portal (http://egypt.gov.eg). Additional services related to the interaction of citizens with ETA are included as well.

ETA has set a clear strategy and action plan aligned with those of the national e-government program. E-government program at ETA started in 2007 and the plan is to complete the required objectives by 2010. In order to reach such objectives, it was important to determine

the resources required for the project. A continuous plan of replacement provides a summary of software and hardware requirements, which can be delivered by carrying out three or four tenders each year. Concerning the required human resources, ETA started hiring new graduates since 2005, as part of a protocol with the Ministry of Communication and Information Technology (MCIT), which provides these graduates with the required training in several IT areas such as, site preparation, cabling, networking, software development, etc.

Several business processes were changed but employees were willing to adhere to the new processes because they perceived the value of ICT in saving them time and effort. For example, the system eliminated redundancy and inaccuracy of the data about financiers by entering each financier's record once, and storing all this data at the server of the central administration of ETA, which is accessible by all units. Despite this positive attitude from the part of the employees towards the e-government program, there is still a need for awareness initiatives to be undertaken to further promote the value of e-government among civil servants and middle managers.

Monitoring and evaluation of e-government at ETA takes place over several levels: a committee constituted from members of different ministries involved in the e-government program meeting every two months, a monthly board of directors, and implementation boards in several areas such as e-payment, digital signature, smart card solution, core system, support system, HR, financial, stock control, etc.

There is a special focus on ensuring strong communication channels with the citizens. Starting 2007, responding to customer inquiries and complaints over the phone was outsourced to a call centre. ETA can also communicate with the public through the national e-government portal and through sending mobile text messages to remind them to present their tax income statement. ETA plans to implement a Customer Relationship Management (CRM) system in the near future but is still having difficulties in ensuring the required budget for it.

Present and future challenges that ETA faces in addition to the shortage of funds are to keep up with the frequent change of tax regulations or procedures. In addition, sometimes there are problems with the outsourcing company that provides technical support and staff training, primarily delaying service provision, or offering insufficient training. Other obstacles lie in maintaining qualified technical IT staff due to the high demand of their expertise in the job market at private companies that provide better rewarding packages than those offered by the public sector.

Although ETA produces high quality information, there is still a need to exert further effort to digitise it. Also, the hardware that exists at ETA's belonging units needs improvements compared to the quality of the software applications used.

The status of EGR at TUNC and ETA in general is considered in a satisfactory position, and will improve gradually with time. As for the importance of the four dimensions in affecting EGR, strategy ranks first as a corner stone in the success of any project. Next, people involved in the project are the second factor, followed by the right processes, and finally the technology which is only considered a tool that aids in realising e-government objectives.

b. Other sources of evidence

Business processes are well defined and documented for all departments; this streamlined each employee's approach to the work process. Employees are also adhering to IT rules that were set during the initial stages of e-government implementation.

Looking at the monthly usage analysis of citizens requesting service from ETA through the national e-government portal showed that the number of users is still very limited. This can be attributed (as revealed by ETA IT Manager) to lack of awareness; but ETA is not planning to promote this service until providing a complete solution by incorporating digital signature technology. The researcher had also access to a list containing all reports and services available online. Forms provided online are intended to have the same design as the traditional ones to encourage citizens to use it.

Observing the workplace allowed the researcher to perceive the positive attitude of the majority of employees, since they were precisely selected for this relatively new unit. TUNC's Head has high leadership skills that enabled continuous communication with the employees. The main problems that the researcher noticed lied in the strong existence of bureaucracy that sometimes hinders the workflow. In addition, sometimes there is a shortage in resources or delay in IT maintenance. Furthermore, management had to postpone carrying out the research several times because they were faced with immediate tasks from ETA or the Ministry of Finance (MOF) with tight deadlines. It was also obvious that ETA was no longer totally dedicated to the e-government project at TUNC as it was in the beginning because ETA, once ensuring that the project was partially stable, started targeting other projects. Employees were always expressing negative comments on two main issues: they are not involved enough during the development stages of new ICT systems; and they are not fully rewarded especially that incentives are hardly depending on work efficiency or qualification.

6.2.3 Ministry of Investment (MOI)

a. Interview with Minister's IT Consultant at the Ministry of Investment (MOI)

Since the establishment of MOI in 2004, the Minister believes that IT impact contributes to more than 40% of the success of the investment sector in Egypt. The e-government strategy and action plan of MOI are based mainly on providing an additional and easy channel of communication for investors to promote investments in Egypt. Although this strategy is aligned to a large extent with the business strategy of the Ministry (around 60%), there is still room for improvement so that e-government would be fully supporting, and affecting at the same time, the strategy and objectives of MOI.

Concerning the resources needed for e-government implementation, funds do not constitute a problem since it is provided from international entities aiming to promote investments in a developing country like Egypt. Evaluation of the required supporting funds always take place based on preset priorities. As for the human resources, e-government tasks are divided into units, and every unit is fully accountable for its responsibility to impose monitoring and control on performance. The IT department at MOI adopts a dynamic policy regarding its human resources with an objective to choose the right people to implement the IT strategy, and to improve the quality of work.

Besides allocating the required resources, e-government implementation also required a change, and sometimes a total re-engineering, of some business processes that can help in facilitating investment procedures for investors. For example, a large part of the information available at the Ministry was digitised and stored electronically; important information to investors is published and always updated on MOI's website; and most of the internal communication between employees now takes place over the Ministry's Intranet. All administrative employees are used to communicate over the Intranet and to access the website to get the information they require, but there is still to increase e-government awareness among ordinary employees (not holding management positions) as compared to policy makers and managers.

Assessing e-government progress is carried out on monthly basis over all IT related areas such as, quality of the website and ways to improve it and to add more online services, foster Intranet applications, increase automation of internal processes and digitisation of different types of information, increase awareness of employees about e-government value and encourage them to rely more on ICT in their work. There is always a continuous monitoring of the usage of the website in all the languages provided: Arabic, English,

French, and Chinese. The website helps in the evaluation of e-government through getting the feedback of investors on the efficiency of the website.

The main challenge to the development of e-government is the lack of ICT and processes integration with the affiliated entities that are under the supervision of the Ministry (such as free zones, capital market, exchange, insurance, mortgage finance, etc.). MOI's aim is to provide a single point for the investor to deal with regardless of the multiplicity of government entities related to the service required by the investor. To achieve this goal, efforts of relevant entities should be coordinated and necessary material and human resources should be made available. There is also a considerable difference between EGR at the Ministry and these different entities. MOI is relatively in a more advanced situation in terms of quality, digitisation, and distribution of information, and in hardware, IT security, and website maturity.

Strategy is considered the most important dimension EGR success, followed by the people dimension. Technology then ranks third before the processes dimension that comes as the fourth factor.

b. Other sources of evidence

Since all employees work on computers and are connected to the Internet, it was important to set clear definition of IT policies. Extensive awareness was provided to the employees about these policies, which enabled them to follow them smoothly.

Analysis of MOI's portal usage (issued monthly) includes detailed information about users accessing the website in the four languages offered such as, demographics about visitors, pages most viewed, time spent at the website and at each page, times of visits, most and least visited sectors, URL of the referral websites, etc. The researcher looked also at a previous study carried out by a consultancy firm in March 2005. This study evaluated an older version of MOI's portal and compared it with investment portals in five other countries: Turkey, Poland, South Africa, Singapore, and Dubai. Comparing the recommendations of the study with the current version of the portal showed that serious steps were undertaken to improve the portal based on the feedback provided by these recommendations.

Interest in improving the website was further substantiated during the visits of the Ministry. The IT Consultant of the Minister was willing to listen to the researcher comments on the portal. He was also encouraging the employees to participate in such matter by submitting their comments and suggestions for improvement. Given that a large number of employees

are in senior positions having busy schedules due to their many responsibilities, IT responsibles tried to develop easy to use IS systems that could save them time and provide them with the information required for decision making. Technology is easily available for all employees and the hardware and IS systems are reliable, well maintained, and updated. All information technology services and developments are performed in-house due to the large number (18 employees) and competence of IT staff. The IT department is divided mainly into the following sub units: software development, networking and security, software and hardware maintenance), website management, and publications and editorials.

6.2.4 Public Hospital (PH)

a. Interview with IT Advisor of the Ministry of Health and Population (MOHP), Former IT Manager of PH

The main reason for thinking about implementing e-government at MOHP (including all hospitals and institutes belonging to it) was the availability of a huge data that needs to be digitised to facilitate the retrieval of the required information. The strategy for this e-government program is in its early stage for the time being. Starting 2009, a joint effort of MOHP with international consultancy and IT companies is targeted towards setting this strategy within few months. For the time being, there is no clear and common strategy shared by public hospitals and institutes. Moreover, applying ICT at PH does not relate to the core business of the hospital. Nowadays, PH does not have the required funds for e-government implementation, but in the future, ICT funds will not constitute a problem for MOHP, and this should be reflected consequently on ICT implementation at PH. Another obstacle for e-government implementation is the absence of well-defined policies for patients check-in and discharge, which prevents keeping a detailed database of all patients visiting the hospital.

MOHP is undertaking significant efforts gathering accurate data about public hospitals encompassing the entire country. This is achieved through acquiring this data from different sources to ensure its correctness. MOHP believes that the main factor in realising success in e-government lies in the availability of qualified people that could achieve remarkable progress in several areas related to the entire project. Furthermore, extensive awareness should be provided to employees, especially to physicians who are always reluctant in applying ICT in their professional work.

There will be serious initiatives to improve the Ministry's website to include services relevant to citizens. Concerning PH, it will be of great benefit to the citizens to access the names of physicians in the hospital and their availability, in addition to information related to the different units at PH.

The main obstacles that hinder e-government development and implementation are centred on people. It is very difficult to change the culture of employees such that they can adapt with new working techniques. Moreover, finding qualified people to be involved in the project constitutes another challenge.

Regarding the four dimensions affecting EGR, strategy ranks first, followed by people, processes, and finally technology. Setting a strong and possible strategy, and selecting the right people lead to the realisation of the other 2 dimensions.

b. Other sources of evidence

The documentation reviewed were the organisation structure of the hospital including the different units and departments of the hospital. It showed that computer usage is limited to data entry (e.g., basic patients' information in each unit, payroll and accounting records, and pharmacy inventory) from the part of one or two clerks in each department.

Several archival records were examined: (i) monthly reports produced from the IT department of PH containing aggregated data about all the activities of PH such as, number of patients and beds, activity of each department, equipment and medication consumed, etc; (ii) archival records available at the General Organisation for Teaching Hospitals and Institutes (GOTHI) including their efforts to automate hospitals and institutes in their domain, and a study to implement a hospital management system to integrate information from all these hospitals and institutes; and (iii) Detailed reports available at the Egyptian Ministry of Health and Population (MOHP) including statistics about all health entities in Egypt. The first impression about these reports was that information was presented in a sophisticated and confusing manner. This view was further strengthened by the IT Advisor of the Minister who revealed the same opinion and expressed also his doubts about the correctness of information provided. This led him to collect the same data through researchers associated with the Ministry and archive them more suitably.

The main observations noticed while gathering data at PH was the reluctance of the employees in responding to the questionnaire. In addition, the majority of computer users have limited education level and IT skills that almost confines them to data entry only without trying to incorporate any progress or development on ICT status at the hospital. The researcher had also the opportunity to interview a number of the physicians and observe them while performing the administrative elements of their work to understand the obstacles that prevent them from using computers. They think that their tight schedules prevent them from allocating time to learn computers and Internet applications; however, more importantly they do not trust that IS applications would be reliable and could replace

paper records. They fear that if they subscribe to an IT project and rely on digital information, it may end up with weak support and maintenance leading to a loss in time and effort. It was also obvious that there is an absence of a vision about e-government implementation at PH. IT is used mainly in organising information and in automating some basic processes.

Evidently, findings of both quantitative and qualitative data provided rich insight into determining the effect of the four dimensions (strategy, processes, technology, and people) on EGR in each of the four case studies under investigation. Comparing both types of data would then serve in confirming such effect and in developing a final version of a framework that assesses EGR of Egyptian public organisations.

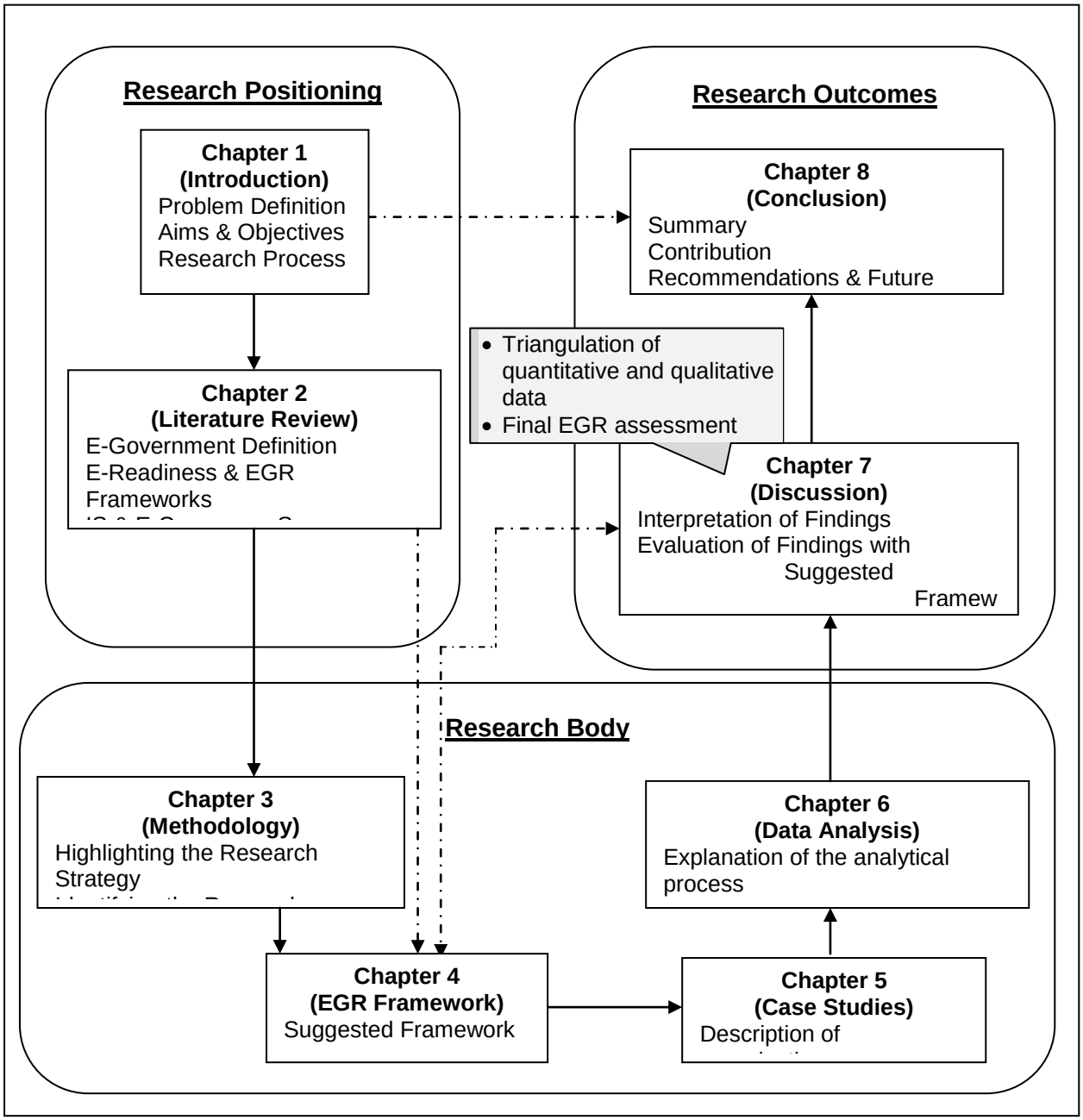
6.3 Summary

This chapter presented the findings of the empirical research undertaken in each of the four Egyptians public organisations selected as case studies to assess E-Government Readiness (EGR) of public organisations in Egypt. First, it reported the quantitative results of each of the fours case studies and set a comparison between them, followed by the combined quantitative results of the four cases to represent the entire country. Next, the chapter presented the findings of the qualitative data gathered from several sources: interviews, documentations, archival records, and observations. In the next chapter, both types of data will be compared for triangulation. Such findings will be examined with regard to the framework proposed in the beginning. This discussion will ultimately lead to the development of a final version of an EGR framework.

7. Discussion

Objectives of chapter 7

- Discuss the findings obtained from the empirical research in each case study.
- Present a final version of a framework assessing EGR of public organisations in Egypt.



qualitative analysis of each of the four case studies were demonstrated. It was also important to combine quantitative data of the four case studies and analyse them in order to represent EGR status of Egypt. This chapter provides a discussion of each case study findings through triangulating qualitative with quantitative results. The objective was to compare both kinds of data to verify the extent to which the empirical research reflected

the proposed framework that was derived from the literature. Next, the chapter presents a critical analysis of the results obtained from adding the quantitative data of the four case studies, and compares them with the framework proposed earlier. Such analysis led to the development of a final version of a framework that assesses EGR of public organisations in Egypt.

7.1 Comparing quantitative and qualitative data

In each case, comparing the quantitative results obtained with the research hypotheses showed that findings confirmed all research hypotheses albeit with varying strength. To further confirm the research hypotheses in each case, qualitative data obtained from different sources was triangulated with quantitative data for two reasons: (i) clarify the rationale behind the perception of the employees who responded to the questionnaire; and (ii) present the real situation of EGR to investigate the difference between perceptions and facts (Osman, 2009). In the discussion of each case study, a table is presented to compare quantitative data retrieved from the questionnaire with qualitative data obtained from interviews, documents, archival records, and observation. In each table, the first column contains the hypothesis under investigation, followed by the result obtained from the quantitative analysis (second column). The other columns present the findings gathered from: interviews, documents, archival records, and observations respectively. The sign "√" inserted in each cell means that qualitative results in this cell confirm its corresponding research hypothesis, proving the existence of a relationship between the two dimensions in each hypothesis.

7.1.1 Montaza District (MD)

Looking at the weights of the factors affecting EGR, the study findings revealed that IT strategy does not have a strong impact on EGR (H1). This could be due to the unperceived value of IT strategy and to the lack of vision and long term planning especially in the public sector due to political, economic, and social inconsistencies. In addition, employees do not perceive the vital effect of IT strategy on EGR because the majority are not only uninvolved in IT strategy formulation, but are not even aware of its existence (as revealed by the interviews conducted with them while responding to the questionnaire). This ascertains the direction of the research in choosing the employees as the sample to reply to the questionnaire because their feedback and participation are not always investigated.

The strong effect of processes on EGR (H2) is easily perceived, since improvements in services and in government internal relationships could not be realised without an attempt to examine and simplify all business processes, and to monitor continuously IT progress

and impact. Also, the impact of technology on EGR (H3) proved to be high because the technology value is easily apparent to the employees; evidently e-government could never exist without applying ICT. Finally, the effect of people on EGR (H4) had the highest weight (P-value = 1.00), ensuring that people are always the major factor in the success of any information system.

With regard to the impact of IT strategy on processes (H5a), on technology (H5b), and on people (H5c); results showed that the impact on processes were the least affected. This confirms the results obtained from the interviews conducted with MD employees; they revealed that IT strategy does not attach particular importance on changing business processes (e.g., software that does not match completely business processes at MD, double workload due to entering data manually and on computers) or on conducting regular evaluation of IT performance. In addition, observing the workplace revealed that online services are not integrated with the organisation's business processes. Top management admitted that ICT strategy did not encompass the integration of business processes with other public organisations interacting with MD.

IT strategy has a modest effect on technology because on one hand, there is always a common belief that IT strategy is not a business issue, and that it is concerned only with technology. On the other hand, since employees were not involved during development phases, they cannot grasp a high impact of strategy on ICT. The high impact of the strategy dimension on people (H5c) means that IT strategy considers people to be a major component, thus focusing on improving their skills and re-allocating them to suitable places (observations and archival records confirmed that ICT training courses in particular are easily provided; also many employees state that they were repositioned as a result of e-government program). In addition, IT strategy has a strong impact on employees' behaviour due to the hierarchical structure of the public sector which drives people to respond positively to changes approved by top management.

Table 7.1 summarises both quantitative and qualitative results obtained from Montaza District (MD).

Hypothesis	Questionnaire	Interviews	Documents	Arch. Records	Observation
H1 Strategy→EGR	Accepted Weak impact	√ - A large number of employees were not aware of the existence of an IT strategy; others did not know its content. - Top management confirmed the existence of an efficient IT strategy (clear drivers, IT policies, objectives; identification of challenges, etc.).	√ - IT policies and procedures.		√ - During responding to the questionnaire, many employees did not know several issues related to the IT strategy.
H2 Processes→EGR	Accepted High impact	√ - Continuous review and improvement of the website - Evaluations of e-government usage, satisfaction, and impact. - Interest in getting citizens' feedback and acting upon it, but not considered as a regular process. - Changes in business processes led to an improvement in service delivery.	√ - Review of business processes that were changed (or re-engineered). - List of the 55 services now provided instantly (in less than 30 minutes)	√ - Regular evaluation of website usage. - provision of a channel to receive citizens' feedback, but not considered as a regular process.	√ - Delivery of instant services.
H3 Technology→EGR	Accepted High impact	√ - Tailor-made software applications		√ - Aggregated	√ - New software applications

		are in continuous development to provide a better service. - Use new applications (e.g., GIS, Project Management).		electronic weekly report demonstrating all requested services and their status.	developed in-house. - New applications are used.
H4 People→EGR	Accepted High impact	√ - Computer users work very hard (work is duplicated: manually and on computers).		√ - Quick and efficient response to citizens' online requests.	√ - Employees have the required computer skills - Employees have high communications skills with citizens.
H5a Strategy→Processes	Accepted Weak impact	√ - Change (or re-engineer) some business processes to reach the objectives set in the IT strategy. - Lack of integration of business processes with other agencies. - Difficulty in changing further business processes.	√ - Review of business processes that were changed (or re-engineered).		√ - No sustainability. Not enough monitoring of e-government performance. - Online services are not integrated with organisation's business processes. - Many employees cannot be easily adaptable to change. - Several initiatives to attempt to simplify business processes.
H5b Strategy→Technology	Accepted Modest impact	√ - Employees were not involved during software development. - Lack of integration of ICT with other			√ - Drawbacks in software applications developed in the beginning.

		agencies. - Provision of the required hardware and networking systems to MD.			
H5c Strategy→People	Accepted High impact	√ - Continuous training is provided to employees - Restructuring to put the right employees at the right places. - Ability to motivate employees. - Determination of accountability.		√ - Training courses provided to employees.	√ - There are always arrangements for training courses. - Qualified employees are highly motivated and full delegation is provided to them. - Clear responsibilities to assume accountability

Table 7.1 – Comparison between Quantitative and Qualitative Results (MD)

7.1.2 Tax Unit for Non-Commercial Professions (TUNC)

The high impact of strategy on EGR (H1) is because employees can appreciate the value of strategy, and can understand its different components (as noticed during assisting employees while responding to the questionnaire). This could be attributed to the high education of employees since the majority hold a four-year college degree (86%). In addition, the percentage of employees in management positions – who are usually involved in strategic planning - is relatively high (33%). In fact, employees in non-managerial positions (subordinates) are not fully aware of many issues related to strategy and of e-government in general (as revealed by the interviews conducted with them and with top management).

Looking at the effect of processes on EGR (H2) shows its high impact since several business processes were changed to avoid errors and redundancy of data. Data about each financier is now entered only once by the responsible employee, and is stored at the central database at ETA, and other entities possess a read-only access. Management is also paying a great attention to website usage analysis and in receiving and analysing the feedback of citizens.

As for the high impact of technology on EGR (H3), this can be perceived because ETA uses technology in enhancing services such as, sending mobile text messages to citizens reminding them to file their tax report, incorporating different services on the website, providing a better service to financiers since it is easy to retrieve all their data and scan their documents (noticed while observing the workplace), and controlling data entry. In addition, technology value is apparent in allowing integration of information about financiers among different agencies (as revealed by interviews with top management, and through examining software applications at TUNC).

Investigating the high influence of the people dimension on EGR (H4) showed that computer users become easily dependent on computers as an integral part of their job (as remarked by the researcher while staying for several days at TUNC. This was also compatible with the opinion of top management who expressed their satisfaction about the skills of computer users). The researcher noticed also that employees dealing with financiers have high communication skills, and are well trained in providing a good service. The effect of people on EGR is also strengthened due to the high qualifications and abilities of the IT staff in different areas related to ICT such as networking, software and hardware maintenance, and software development (as stated by top management).

Regarding the high effect of strategy on processes (H5a), top management ascertains that several business processes were reengineered to be able to realise the objectives set in the IT strategy. Top management stated also that e-government evaluation is undertaken regularly within ETA and with other related ministries. Furthermore, they expressed their interest in sustaining a strong communication with citizens to obtain their feedback on e-government performance in writing, through the website, or via the call centre established especially for this purpose. Observing the work place showed also the power of strategy in defining and streamlining business processes to avoid duplication of work, hence speeding up the entire workflow.

The modest impact of strategy on technology (H5b) is chiefly a result of employees observing both strong and weak points of the effect of strategy on technology. For example, most of the required hardware and networking systems were delivered, but still there is a need to renew some computers and printers (noticed by the researcher, and known also from interviewing employees and top management). Certainly, a large amount of information was digitised but the entire workflow was not yet automated, and TUNC still relies on paper work in several business processes (as revealed by top management and observed as well). The effect of strategy on technology is also perceived easily since it was decided since the very beginning to develop all software applications in-house, yet several employees said that the efficiency of software applications could have been higher if they were more involved during software development. While TUNC provided a computer for every employee dealing with financiers (known through observations and interviews with top management), software and hardware maintenance are not always available immediately due to bureaucratic complications. Employees also feel that ETA plans are always directed towards using new technologies (such as digital signature, smart card readers, new channels to communicate with the citizens) but sometimes they are not fully aware of such new plans

Finally, the high effect of strategy on people (H5c) is attributed to the emphasis of strategy on having highly qualified human resources either by hiring new competent employees, or by providing training courses to existing ones (as expressed by top management). This fact was further confirmed when observing the high skills of computer users at TUNC, and the ability of IT staff to perform the required software, networking, and hardware tasks. Observations showed also that there are continuous arrangements for training courses to improve employees' computer skills. Leadership, an important component in the strategy dimension, can be clearly seen in the ability of TUNC's Head to motivate employees and to encourage them to communicate with the TUNC's Head. Finally, any change in IT plans

is directly reflected on employees as they have to follow updated instructions to produce any additional required information, and adhere to any deadline set by top management (noted through the researcher visits to TUNC).

Table 7.2 presents the findings obtained from both quantitative and qualitative data at Tax Unit for Non-Commercial Professions (TUNC).

Hypothesis	Questionnaire	Interviews	Documents	Arch. Records	Observation
H1 Strategy→EGR	Accepted High impact	√ - Some employees said they are not acquainted with some IT strategy elements. - Top management confirmed the existence of an efficient IT strategy (clear drivers, objectives, action plan; identification of challenges). - Changes in strategy due to changes in legislations.			√ - Most employees did not find a difficulty in responding to the strategy part in the questionnaire. - High leadership skills of top management due to their ability to change major issues related to ICT applications due to changes in legislations.
H2 Processes→EGR	Accepted High impact	√ - Changes in business processes eliminated data redundancy and inaccuracy.	√ - Review of business processes that were changed (or re-engineered).	√ - Regular evaluation of website usage. - provision of a channel to get citizens' feedback through the national e-government portal, but not considered as a	√ - Employees perceived the value produced by the change in some business processes.

				regular process.	
H3 Technology→EGR	Accepted High impact	√ - Software applications controlled data entry which eliminated data redundancy and inaccuracy. - Software applications allowed the integration with the data in other agencies to inquire about the status of each financier.		√ - Aggregated electronic weekly report demonstrating the status of all financiers.	√ - Efficient software applications. - Information is shared internally, with ETA, and with other public agencies.
H4 People→EGR	Accepted High impact	√ - High skills of computer users. - Qualified IT staff which allowed all applications to be developed in-house.		√ - Quick and efficient response to citizens' online requests.	√ - Employees have the required computer skills - Employees have high communications skills with financiers.
H5a Strategy→Processes	Accepted Modest impact	√ - Change (or re-engineering) of some business processes to reach the objectives set in	√ - Review of business processes that were changed (or re-engineered).		√ - No duplication of work due to well defined and streamlined business processes. - Little emphasis on getting

		the IT strategy. - Regular evaluation of e-government initiatives inside ETA and with other ministries. - Strong communication channel with citizens to get their feedback (through the website and a call centre), but not a regular process.			employees' feedback; moreover it is not evaluated regularly.
H5b Strategy→Technology	Accepted Modest impact	√ - Employees were not sufficiently involved during software development. - Providing the required hardware and networking systems and evaluating them regularly over all ETA, but the hardware still needs improvement. - Further information should be digitised. - All software applications are developed in-house. - Continuous interest in enhancing services through			√ - Providing a computer to each employee responsible for financiers. - Employees are not aware of all software applications developed. - Sometimes the required software and hardware maintenance is not provided, or sometimes delayed due to bureaucracy. - Development of further software applications would help in automating the whole work cycle. - Development and maintenance

		implementing new applications (digital signature, smart card readers, automating the entire workflow).			of software applications by IT employees at ITA.
H5c Strategy→People	Accepted High impact	√ - Provide training to newly graduates in several ICT domains as a protocol with the Ministry of Communication and Information Technology - Provide IT training to existing employees through the outsourcing company. - Ability to motivate employees. - Immediate instructions that interrupt employees work.		√ - Training courses provided to employees.	√ - There are always arrangements for training courses. - IT staff is highly qualified and able to develop all software applications. - Employees enjoy a direct access with the TUNC's Head. - Employees are continuously faced with emergent situations that they have to act upon directly.

Table 7.2 – Comparison between Quantitative and Qualitative Results (TUNC)

7.1.3 Ministry of Investment (MOI)

Results obtained showed the high impact of the four dimensions strategy, processes, technology, and people on EGR (hypotheses H1, H2, H3, and H4). First, the strategy dimension is clearly apparent in affecting EGR (H1) because e-government is one of the main objectives in the business strategy of the Ministry. The Minister's special interest in the e-government program was reflected on the entire staff driving IT responsibles to set a clear e-government strategy taking into considerations all strategy components. Employees understood the value of strategy on e-government because they were involved in its formulation. Furthermore, the decision to produce the website content in different languages had a great impact on reaching a wider audience worldwide. Since top management's plan was to develop all ICT applications in-house, changes and improvements take place without delays, and MOI's website content is considered among the most updated governmental websites.

Regarding the high effect on processes on EGR (H2), interviews with top management and employees confirmed that several business processes were changed or re-engineered to simplify processes undertaken by investors. There is also a continuous review of MOI's website's performance based on the feedback of employees, experts, and investors (noted from interviews with top management and employees, and also from observations and reviewing the usage analysis reports produced, and of the previous studies undertaken to evaluate the website).

Technology influence on EGR (H3) is reflected in the development of tailor made software applications that help senior employees (constituting 70% of the total number of employees) in decision making, and in producing daily reports about all MOI's activities (known through interviews with top management and observations). In addition, the presence of such an efficient website has certainly a strong effect on e-government performance. The researcher also noticed the great effect of technology manifested in the use of MOI's Intranet as the employees' main communication tool.

The high impact of people on EGR (H4) is due to the relatively high level of education (all of them have a four-college degree, and around 16% hold a master degree) and high computer skills of employees compared to the level of education and computer skills of employees in the three other organisations studied (MD, TUNC, and PH). The people effect is also witnessed in the ability of management to employ qualified IT staff capable of fulfilling development and maintenance requirements (as revealed by top management and observed by the researcher during visits of the Ministry).

As for the modest effect of strategy on processes (H5a), interviews with top management (as well as observations) showed that one of the main tasks in the strategy's action plan was to review and simplify business processes. While this business process change led to efficient outcomes, there are still difficulties in integrating them with the other nine entities affiliated to the Ministry. One of the main directions of IT management (as observed by the researcher) is to maintain e-government sustainability by considering e-government evaluation as an ongoing process. Also, the IT Consultant of the Minister expressed a special interest in obtaining the feedback of the researcher regarding the content and design of MOI's website during the interview.

Strategy has also a modest impact on technology (H5b) because on one hand technology requirements are fulfilled with continuous initiatives to adopt the latest technologies (as stated in interviews with top management and employees, and noted during observation), in addition to the emphasis on the strategic role of the website; but on the other hand there is a need for a strategic decision to allow the integration of ICT with other entities belonging to MOI.

As opposed to its modest effect on processes and technology, strategy has a high impact on people (H5c). Top management, supported by observations, confirmed the continuous interest in providing training courses to employees whenever required. Top management and employees stated that management promotes e-government through organising seminars to the employees to keep them updated of the continuous progress of e-government, and to listen to their suggestions. Top management affirmed also that e-government strategy caused restructuring to improve allocation of human resources and to exhibit more control and accountability (also noticed by the researcher). Moreover, top management declared that there are continuous efforts to foster internal communications through the Ministry's Intranet. This fact was confirmed through perceiving the employees reliance on the Ministry's Intranet in most of their internal communications.

Hypothesis	Questionnaire	Interviews	Documents	Arch. Records	Observation
H1 Strategy→EGR	Accepted High impact	√ - Employees were aware of the existence of an IT strategy because they perceive its impact. They were sure that e-government program is progressing through a methodological approach. - Top management confirmed the existence of an efficient IT strategy (clear drivers, IT policies, objectives; identification of challenges, determination of funding sources, accountability, extensive awareness provided to employees, etc.). - The Minister believes that 40% of the success of the investment sector is attributed to e-government. - The decision to launch a website was to provide a single point that deals with investors instead of struggling in communicating with different entities.	√ - IT policies and procedures.		√ - During responding to the questionnaire, employees did not find any difficulties in responding to several issues related to the IT strategy, but some of them revealed that some parts were not relevant to them. - There was a strategic decision to provide the content of the website in several languages (Arabic, English, French, and Chinese) to attract a wider range of investors worldwide.

		- Perform all ICT services and applications in-house.			
H2 Processes→EGR	Accepted High impact	√ - Continuous review and improvement of the website - Monthly evaluation of all areas related to e-government usage: website, Intranet, increase processes' automation, and digitise different types of information. - Interest in getting employees' and citizens' feedback about websites' improvement. - Changes in business processes led to an improvement in service delivery.	√ - Review of business processes that were changed (or re-engineered).	√ - Detailed regular evaluation of website usage. - Interest in studies carried out to evaluate the website and acting upon the recommendations provided.	√ - Employees were satisfied about the changes incorporated in some processes because they led to an improvement in the whole workflow.
H3 Technology→EGR	Accepted High impact	√ - Tailor-made easy to use software applications to help in decision making. - Continuous improvements on the website.		√ - Daily detailed reports about MOI's activities.	√ - New software applications developed in-house. - Efficient design and content of the website. - Most internal communications are channelled through MOI's Intranet. - Continuous update of the website's content in all languages provided.

H4 People→EGR	Accepted High impact	√ - Employees working in IT are highly competitive. - High education of all employees (16% holding master degrees).			√ - Employees have the required computer skills - IT services are scheduled in advance. - Efficient communication between employees and Technical Services Department. - The Technical Services department includes all required departments and resources.
H5a Strategy→Processes	Accepted Modest impact	√ - Change (or re-engineering) of several business processes to reach the objectives set in the IT strategy. - Lack of integration of business processes with other agencies.	√ - Review of business processes that were changed (or re-engineered).		√ - Several initiatives to attempt to simplify business processes. - Special focus on considering e-government evaluation as a regular process.
H5b Strategy→Technology	Accepted Modest impact	√ - Providing the required technology to all employees. - Lack of integration of ICT with other agencies. - One of the main objectives of the IT strategy is to digitise a large amount			√ - High Quality and reliability of ICT. - Strategic interest in providing the latest technologies. - Strong and efficient website

		of the information available at MOI.			
H5c Strategy→People	Accepted High impact	√ - Continuous training is provided to employees. - Restructuring to place employees at the most suitable places. - Ability to motivate employees. - Determination of accountability. - Promote e-government concept and initiatives internally through organising seminars that present e-government achievements at MOI. - Encourage employees to rely on ICT on their daily work.			√ - There are always arrangements for training courses. - Clear responsibilities to assume accountability. - Provide all ICT services to employees whenever needed.

Table 7.3 – Comparison between Quantitative and Qualitative Results (MOI)

7.1.4 Public Hospital (PH)

Referring to the reason behind selecting PH as a case study, the choice was based on the assumption that the importance of some factors is more ascertained by the consequences of their absence rather than the effect of their existence. Since PH is at an early stage in terms of e-government, it was essential to investigate the most important factors affecting EGR and understand the environment in which the health sector operates.

Results obtained from the quantitative data proved a weak impact of the strategy dimension on EGR. This was confirmed during assisting employees while replying to the questionnaire; they expressed difficulty in understanding the questions in the first part related to the strategy dimension. This could be partly due to the fact that a large percentage of employees are not highly educated (44% do not hold a four-year college degree). After explaining each item in this part, they still could not see the full value of strategy on EGR because of: (i) their limited knowledge; and (ii) their inability to perceive any effect of a good strategy on e-government at PH. They were only certain that if there was an ICT plan, this would have simplified their work and would have allowed them to provide a better service to patients. Although this fundamental belief could be the launching base for future ICT plans in PH, at present this in itself is not sufficient. In addition, while spending several days at the hospital, the absence of any IT plan became evident to the researcher. Furthermore, top management at PH stipulated that there is no e-government strategy currently active to the best of their knowledge. The former PH IT Manager blamed the absence of strategy on the lack of funds which prevents any ideas for e-government development. He stated that it is also difficult to plan to automate patients' records of PH because there are no clear policies and procedures governing patients check-in and discharge. Many patients do not originally belong to the hospital, but are transferred from other geographic locations where their records are first created but not necessarily transferred to PH.

The high impact of processes on EGR (H2) is because both employees and top management feel the negative consequences resulting from following old and inefficient business processes. The researcher noticed that employees felt incapable of helping patients (For example, when they request appointments with physicians or try to make reservations for radiology or lab diagnosis) because of the inefficient and slow processes they should adhere to.

As for the modest effect of technology on EGR (H3), it is attributed to the fact that employees saw the importance of the software applications at PH in automating the

workflow, and in providing aggregated monthly reports showing different activities of the hospital (reviewed by the researcher). In addition, employees expressed their need for more software applications and better hardware systems. Top management revealed that technology helped in providing the statistics they required which will lead to an improvement in services provided to citizens. For example, storing patients' records that include information about their visits to PH and their health conditions, and providing them to physicians facilitates and speeds up the physical examination process. It was also obvious for management and employees that the existence of a website - from which essential information (e.g., the names of physicians and schedules of clinics) could be accessed - will be a significant step towards applying e-government.

People are the most influential dimension affecting EGR (H4) in the opinion of both employees and top management. Instability of management positions and lack of coordination between management at different levels led to this thinking (all over PH, GOTHI, and MOHP). In addition, interviews with both employees and top management (in addition to observation at the workplace) attested to the poor IT qualifications of employees. The importance of people is also obvious due to the fact that physicians do not rely on computers in their work and do not have the intention to change their standpoint towards adopting technology. Moreover, the trend in PH as well as most MOHP entities is to choose physicians, who do not necessarily possess sufficient IT knowledge, to fill IT management positions. This always proves to be inadequate. The drawbacks stated above -easily apparent - send employees a strong message that alleviating such drawbacks will be the main pillar towards improving EGR.

Findings showed also that strategy has a weak impact on processes (H5a), and on technology (H5b). Top management admitted that there are still no regular processes undertaken to evaluate ICT performance, and that due to the absence of a common strategy between the different responsible entities, any attempts to integrate business processes internally or between PH and other related authorities cannot be implemented. PH and GOTHI IT management are not only uninvolved with MOHP in formulating e-government strategy, but are also unaware of any details about it. Consequently, top management were unable to value the effect of strategy on processes and technology. Strategy effect on technology cannot also be perceived due to the poor status of ICT systems. Even for existing technologies (Internet and Intranet connections), only a small number of employees have access to them. For those using them, they do not fully benefit of their availability; they just use them for limited tasks such as video conferencing on the Intranet, and surfing for research papers on the Internet.

Finally, the high effect of strategy on people (H5c) is because top management are planning to hire qualified staff because they understand clearly the value of human resources in the success of e-government. Also, one of the main e-government plans (as revealed by top management) is to first target public hospitals and institutions where employees and management have the flexibility to change their work style. One of the main components of e-government strategy will be to promote e-government among employees and management in the health sector. Spending several days at the hospital allowed the researcher to notice that employees lack awareness about the benefits of e-government, and that there are no plans for providing additional training to them. However, it was obvious that employees fully abide with instructions set by top management. This proves that if a strong action plan stemming from any e-government strategy is decided and applied by top management, employees will definitely follow it.

Hypothesis	Questionnaire	Interviews	Documents	Arch. Records	Observation
H1 Strategy→EGR	Accepted Weak impact	√ - Employees were not sure of the existence of an IT strategy. - Top management confirmed the absence of an IT strategy, and the need for an efficient one. - Lack of funds to improve ICT at PH.			√ - No plans for IT use and development.
H2 Processes→EGR	Accepted High impact	√ - One of the main obstacles in implementing e-government is that processes are old and inadequate, and need to be changed (i.e., it is an important dimension in affecting EGR).			√ - Bureaucracy prevents the change of static processes. - No evaluation of e-government limited initiatives.
H3 Technology→EGR	Accepted Modest impact	√ - Technology helped in providing statistics about activities at PH, and about national health information. - Improving the website content will provide the information required by		√ - Monthly reports combining PH's statistics.	√ - Software applications affect workflow automation which enhances services provided to patients. - There is a need for additional software applications to replace paper work, and to provide a patients' database.

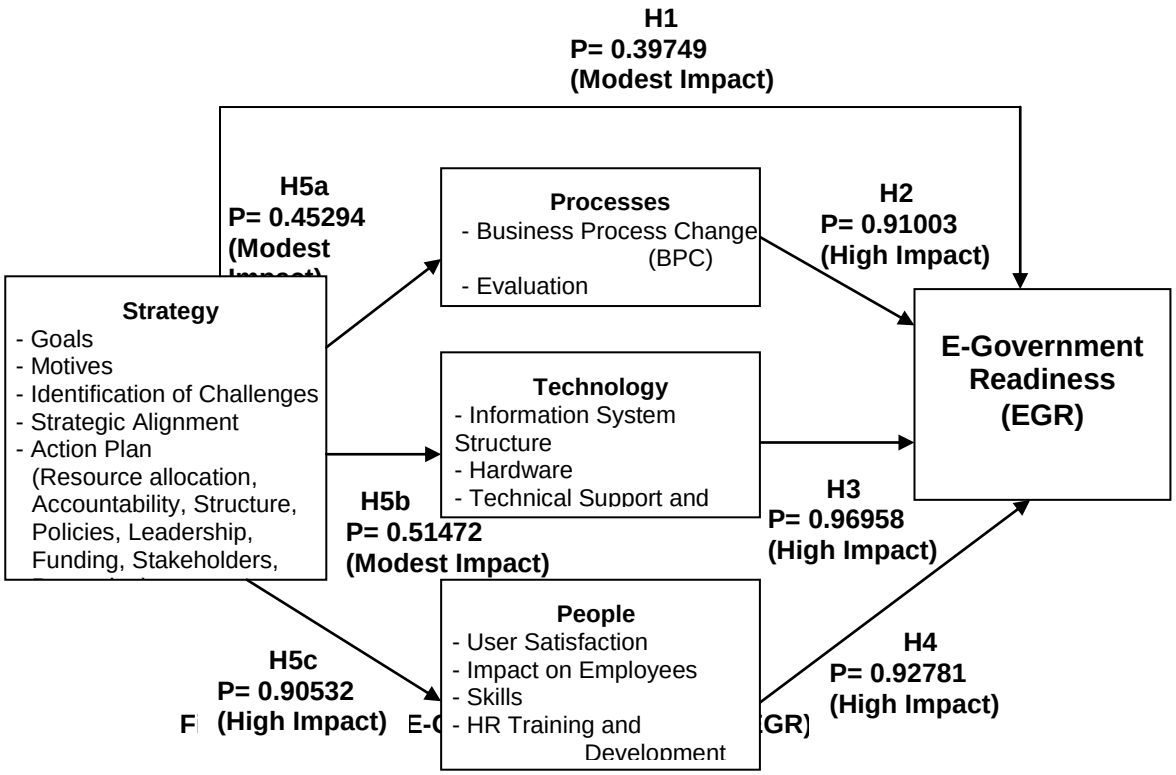
		patients.			- ICT shortage prevents employees from providing a better service for patients.
H4 People→EGR	Accepted High impact	√ - It is not easy to find qualified people in various tasks related to e-government. - Changing the culture of physicians towards using ICT in their work constitutes a big challenge. - Several initiatives are undertaken from different entities but lack of coordination between them impact e-government development negatively.			√ - Employees need more technical training. - Responsible of e-government projects should be physicians. - Employees have high communications skills with patients.
H5a Strategy→Processes	Accepted Weak impact	√ - No monitoring of e-government initiatives. - No common strategy between different responsible entities due to lack of coordination. This has a negative effect on streamlining and integrating business processes. - The Ministry of Health and Population (MOHP) is performing regular scanning of all public hospitals and medical entities to			√ - Any ICT strategy cannot cause a major change in business processes. It just acts as a complementary process without being integrated with other business processes at PH.

		obtain accurate information required for building a national database about health sector.			
H5b Strategy→Technology	Accepted Weak impact	√ - Poor assessment of hardware equipment and software applications. - Build a database of all public hospitals and medical entities.			√ - Computers need to be renewed. - The majority of the employees do not have an Internet access. - The Intranet connecting the hospitals belonging to the General Organisation for Teaching Hospitals and Institutes (GOTHI) is not fully used. It is only used in video conferences in few occasions.
H5c Strategy→People	Accepted High impact	√ - There is a plan to hire qualified employees. - Strategy is planned to be implemented on people that have the tendency to change. - Top management realises the importance of people in e-government progress and the need to provide awareness to the employees.			√ - No obvious steps performed to provide awareness or more training to employees. - Top management at PH has a strong influence on employees.

Table 7.4 – Comparison between Quantitative and Qualitative Results (PH)

7.2 EGR framework of Egypt

Combining the data obtained from the samples of the four case studies showed that the average score of each of the four research dimensions is relatively high, ranging from 5.00 to 5.44; which means that employees' feedback towards the research dimensions was highly positive (since the ranking is on a measurement scale from 1 to 7). The same positive perception towards the framework's dimensions was not expressed by the employees while conducting informal discussions with them. Although the majority of employees were satisfied to a certain extent with most of the constructs under each dimensions, sometimes, they revealed negative impressions towards ICT status, e-government strategy, and lack in the integration of processes. For example, concerning hardware and software maintenance provided at TUNC, although the means of the constructs of service quality were high (under the technology dimension), many employees were complaining about delays in replying to their needs in case of hardware or software problems. The high average score in the quantitative data could be attributed to a cultural aspect that characterises Egyptians when responding to surveys; feeling uncomfortable in expressing negative impressions towards a person or even a concept (Manawy, 2006) especially in case of surveys related to their work environment.



Findings about the relationships between the different dimensions of the framework confirm all the hypotheses of the framework. The three dimensions: processes,

technology, and people have a high impact on EGR; whereas strategy has a modest impact. Regarding the effect of strategy on the three dimensions: processes, technology, and people; findings revealed that strategy has a modest impact on processes and technology, and a high impact on people. The final version of the EGR framework including the strength of the relationships between its different dimensions is presented in figure 7.1

The modest effect of strategy on EGR (H1) is attributed to three reasons: (i) it is difficult to appreciate the effect of strategy because due to the limited education level of some employees at certain organisations, employees could not realise the exact meaning of strategy and its value; (ii) the low level of awareness of a large number of employees about the e-government strategy at their organisations prevents them from perceiving its effect; and (iii) strategy components are not always entirely considered from the part of top management responsible of setting e-government strategy.

Findings highlighted also the importance of processes on EGR (H2). This ensures the transformative nature of e-government; it is not simply about using ICT, but it is rather about changing the way governmental organisations work. Therefore, it is important to review processes and to have a clear vision about means to streamline and integrate them internally and with other organisations as well. In addition, evaluations of e-government projects should be conducted regularly to assess citizens and employees' satisfaction, and to monitor any gap between the design and implementation phases.

Further, results revealed that despite the high impact of technology on EGR (H3), e-government strategy in all cases did not put enough emphasis on technology (H5b) since it has a modest effect on technology. This could be due to the limited budgets in funding e-government projects that reduces the ability to put long term plans on investments on technology.

Finally, relations concerning the people dimension cause high effects whether people is a dependent variable affected by strategy (H5c), or an independent variable affecting EGR (H4). This means that people are the major factor in the introduction and success of e-government projects.

Results showed also that impact of strategy on processes (H5a) is weak in old organisations (MD was established in 1982, and PH in 1923) in contrast with its high impact on new ones (TUNC and MOI were established in 2004). In their early stages, usually organisations take the best practices and have clear strategies which they tend to

adhere to. Furthermore, processes in new organisations can be formulated and adjusted easier than in old organisations where processes are somewhat more rigid.

It was also important to determine the constructs that have the highest effect in each of the four dimensions through considering the factor analysis of the combined data of the four case studies (see appendix I).

The most affecting constructs in the strategy dimension are: (i) specification of the motives or compelling reason, and the challenges for the development and implementation of e-government; (ii) considering Internet activities as one of the major goals; (iii) leadership; (iv) determination of accountability; (v) consideration of the value on each stakeholder; and (vi) building awareness of e-government among employees in each organisation.

In the case of processes, the most influencing factors were: (i) definition and streamlining of business processes and motives of changing them; (ii) evaluation of citizens' perspectives towards e-government including usefulness, usability, satisfaction, and trust; and (iii) regularly obtaining employees' feedback concerning their satisfaction about ICT systems in terms of usefulness and ease of use.

With respect to the technology dimension, the issues of most concern are: (i) timeliness and accuracy of information; (ii) quality of software systems including reliability, usability, accessibility, flexibility, internal integration; (iii) security of data; (iv) horizontal integration of hardware systems (i.e., between organisations); and (v) quality of technical support and development services focusing on reliability and commitment.

Finally the factors affecting the people dimension the most are: (i) employees' skills such as: ease of communication with citizens and other departments, and adaptation to change; and (ii) human resources training and development including availability, quality, relevancy of the both technical and non-technical training provided, and the degree to which employees are involved in determining the training they need, and in evaluating the training courses they attended.

7.3 Summary

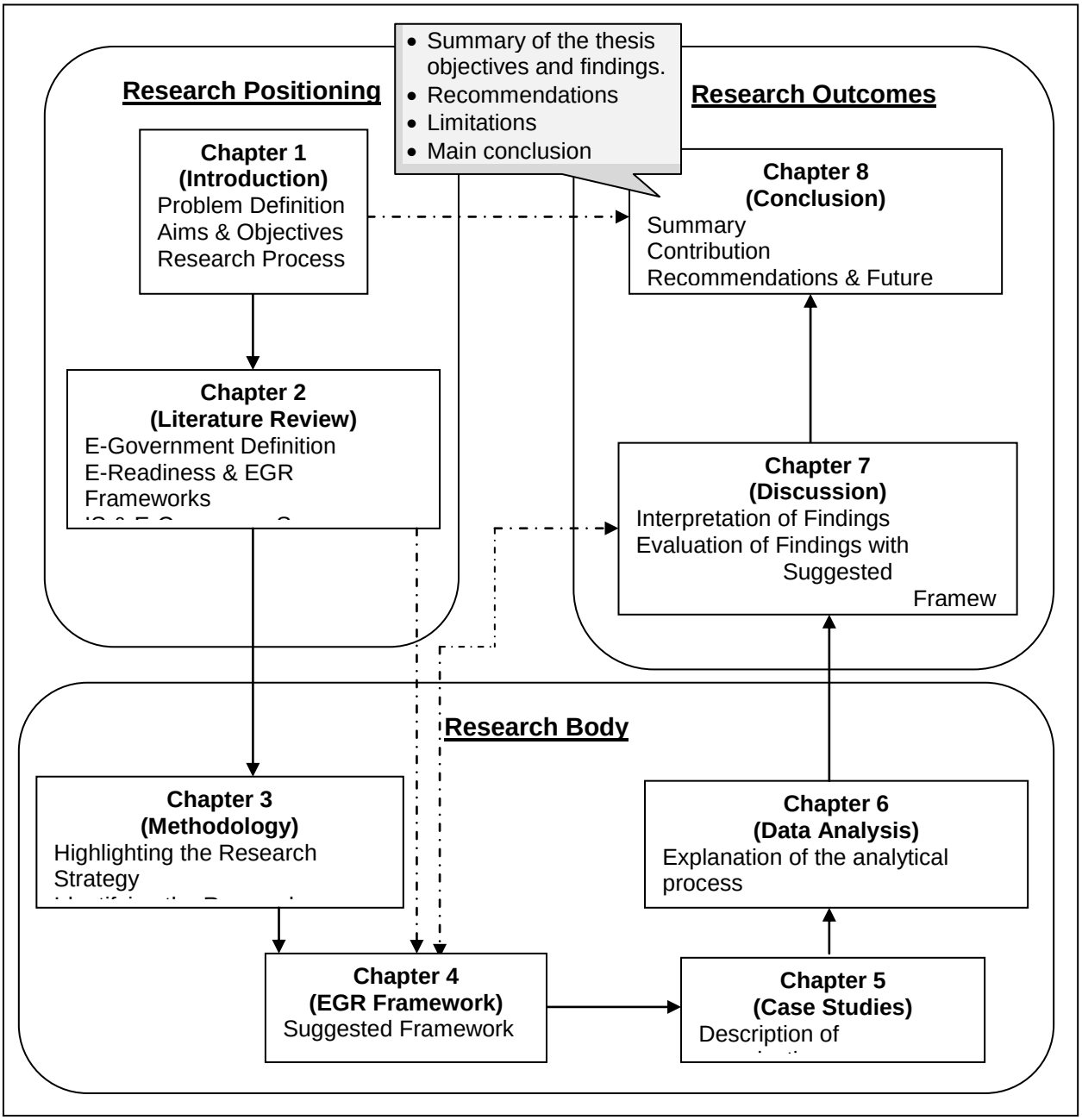
This chapter discussed the findings obtained in each of the four case studies through comparing those gathered from the questionnaire with the qualitative data collected from interviews, documents, archival records, and observations. The chapter reviewed also the combined quantitative data of the four case studies to represent Egypt. Comparing the overall model of Egypt derived from the results with the one drawn from the literature proved that all research hypotheses were confirmed; thus guiding to the development of a

final framework for assessing EGR of public organisations in Egypt. The next and last chapter will summarise the entire research, and will state its main limitations. It will also conclude upon the work undertaken and will provide recommendations for the organisations studied, policy makers, and further venues of research.

8. Conclusion

Objectives of chapter 8

- Provide a summary of the entire thesis.
- Indicate the limitations of the research.
- Discuss recommendations and future research.



of the four case studies. It then presented the results of the data combined from these cases to represent public organisations in Egypt. The chapter concluded that findings

confirmed the research hypotheses, proving the viability of the framework derived from the literature. This chapter reflects upon the entire thesis starting by summarising it, highlighting the research gap, and explaining the contribution of the thesis in filling the research gap and in answering the research question raised in the beginning. The chapter offers then recommendations for the organisations studied and for policy makers, discusses the research limitations, and finally suggests avenues for future research.

8.1 Summary of the thesis

E-government has become the key term used to suggest a solution for public sector problems either internally or in its interaction with citizens. This drove governments worldwide to attach particular importance to e-government, and to allocate significant resources for its development and implementation. Eventually, such a project cannot be implemented in isolation without having a thorough understanding of the context in which e-government operates. Therefore, it is important to conduct research to assess the readiness of public organisations for e-government.

The literature reviewed in this study indicated that there appears to be little examination of the electronic administration of e-government (e-administration). The reason behind ignoring e-administration and focusing instead on governmental websites in assessing E-Government Readiness (EGR) is mainly due to the convenience and simplicity in evaluating the latter. For the majority of stakeholders, adding more services to the website means more progress and success of e-government project. As for researchers and survey institutes, they mainly consider basic website measurements among their criteria. Consequently, policy makers are tempted to give front office (i.e., website) special emphasis and direct most resources towards such issue since it satisfies e-government stakeholders, researchers, and survey institutes. Such approach will not lead to a sustainable progress of e-government; without having an efficient back office governments will never be able to serve citizens either from online or offline channels. Further, the literature focuses on assessing EGR over entire countries resulting in a clear gap in investigating EGR over a public organisation scale.

This thesis was aimed at filling this gap. The intention however was not to start research in isolation, but to draw on previous literature and to ground the research into the context of knowledge already attained. In this way, the study has used the positivistic approach to ensure objectivity through deriving the research hypotheses from related literature in e-readiness, EGR, IS and e-commerce success models. A suggested framework was developed encompassing the effect of four main dimensions - (i) strategy, (ii) processes, (iii) technology, and (iv) people - on EGR, as well as the relations between them. The

proposed framework was tested using an empirical research on four public organisations representing different sectors in Egypt. The research used case study as a research strategy to serve this purpose because it allows in-depth investigation through different data collection methods: (i) obtaining employees' feedback through a questionnaire; (ii) conducting interviews with top management; (iii) carrying out interviews with employees; (iv) reviewing documentations; (v) examining archival records; and (vi) observing the work environment. This enhanced the research objectivity and helped in attaining a representative conclusion as much as possible through triangulating the data collected from different sources of evidence. Findings confirmed all research hypotheses leading to presenting a final framework that assesses EGR of public organisations in Egypt.

The thesis though provides an insight into the e-administration dimension, especially on a micro - rather than a macro - level (i.e., over a public organisation); such perspectives of e-government had been largely overlooked in the past. In addition, the research did not rely only on literature or secondary data in developing the EGR framework, but used also an empirical research to enable the researcher to better understand the context of the research. The use of in-depth investigation of public organisations in a developing country like Egypt is also a significant contribution, since the few studies approaching e-administration (discussed in chapter 2, section 2.3) focus on developed countries. The approach and findings of this research have therefore increased the body of knowledge in the field of information systems and e-commerce in general, and in e-readiness and e-government readiness in particular.

The next section revises the research question and proves that the thesis provides an answer for it.

8.2 Answering the research question

The research question posed in the beginning of the thesis was the following:

> What is the framework that could best assess E-Government Readiness (EGR) encompassing all internal factors affecting e-government within a public organisation?

The framework shown in figure 8.1 provides the answer to this question.

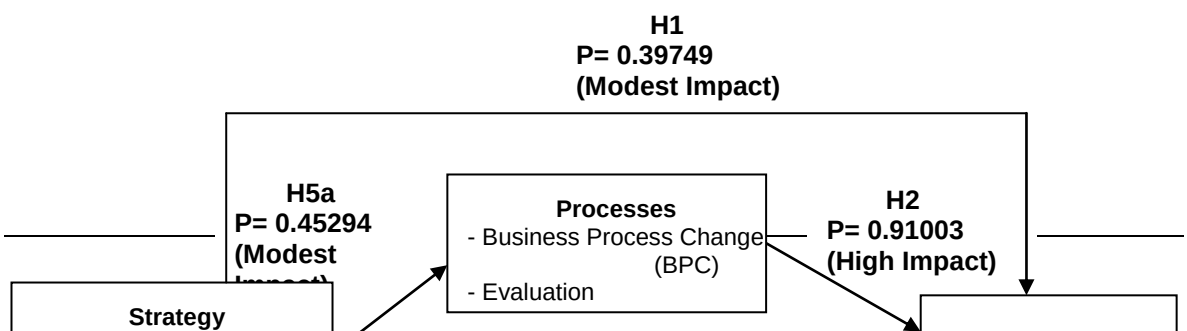


Figure 8.1 – E-Government Readiness (EGR) Framework

The developed framework contains the internal factors affecting EGR which are categorised into four main dimensions: (i) strategy, (ii) processes, (iii) technology, and (iv) people. As demonstrated in the figure, there are a number of measuring constructs in each of these four dimensions to measure their effect on EGR. The framework highlights also the effect of the strategy dimension on the three other dimensions.

The research proved the high effect of processes, technology, and people on EGR as compared to the modest impact of strategy on EGR. The thesis highlighted also the modest impact of strategy on processes and technology, and its high impact on people.

Quantitative analysis of the data obtained also provided important information about the constructs that had the highest weights in each dimension (identification of these constructs are stated in chapter 7, section 7.5).

8.3 Considerations for the organisations studied

The research findings (presented in chapter 6, and discussed in chapter 7) revealed that there are several areas where changes could be usefully made.

There is a need for the Montaza District to consider education and competence level as a main requirement while hiring new employees. Also, choosing the correct software applications will stop the development of further scattered applications in-house (which attempted to cover the drawbacks of existing ones). Quantitative analysis revealed that promoting e-government throughout the district is one of the main factors affecting EGR. In addition, conducting regular evaluation of citizens' feedback, and definition and streamlining of business processes proved to have high influence. Concerning

technology, the quality of the website and the data security have the highest weight; whereas training provided to employees is the most important construct related to people. While employees expressed the adequacy of the training courses they attended to their needs, the researcher noticed that some specialised courses in software and web development were sometimes provided to employees without investigating their usefulness for future applications. This dictates reviewing the relevancy of the training courses to the needs and tasks of employees.

As of the Tax Unit for Non-Commercial Professions (TUNC), initiatives should be taken to improve the hardware and ICT maintenance. The most important factors in affecting EGR (having the highest weights) – obtained from the quantitative analysis – are the existence of an action plan in the e-government strategy, and the determination of e-government challenges and accountability. Other constructs which proved to have high weights are the alignment of IT investment with the strategy and plans of TUNC, the determination of the role of each stakeholder, and the value of e-government on each. Further, conducting regular evaluation of citizens' and employees' feedback is the main factor in the processes dimension. Within the technology dimension, the hardware and the responsiveness and timeliness of technical support are the most affecting factors. Finally, ICT impact on the performance and flexibility of employees are also key factors in the people dimension.

The third case study, the Ministry of Investment (MOI), one of the most successful cases in terms of e-government application in Egypt, should consider also the integration with entities under its supervision, and should also ensure the continuous support of the Minister for the e-government project because it is the key factor in its success. Quantitative analysis showed that the most affecting component in the strategy is considering all Internet activities as one of the major e-government goals. Further critical factors are: leadership, resource allocation, identification of challenges, establishment and implementation of IT policies and procedures, alignment of IT investment with MOI's strategy and plans. Obtaining regular feedback of citizens and employees is the most influencing factors in the processes dimension. As for the technology, the principal factors are the usability and flexibility of software systems, the security of data, and the competence of technical support staff. Finally, the pivotal factors in the people dimension are: (i) provide proper training to the employees; (ii) involve them in deciding the training courses; and (iii) get their feedback in the training courses they attended.

The last case study of the Public Hospital (PH) is a clear example demonstrating the lack of e-government strategy and the weak coordination between IT management at different

levels of responsibility. Special focus should be provided to correct both issues, and to investigate means to change inefficient business processes through addressing the cultural and bureaucratic challenges that hinder this change. PH's e-government strategy should also consider improvements of the website by adding useful content and providing basic online services as a start. Enhancement in ICT quality in general should also be considered as well as determining ways to encourage employees to use ICT through providing them with additional training and support. Furthermore, the restrictive approaches to the use of the technologies - Internet, Intranet and email - should be revised because it results in diminishing opportunities for progress. The fact that PH's top management instructions are strictly followed in the entire hospital would definitely help in this regard in case policies and procedures would be particularly set for such purpose.

Quantitative findings considered the existence of an action plan, fostering ICT use, and top management support as the main affecting factors in the strategy dimension. Concerning the processes dimension, Business Process Change (BPC) is the most important factor comprising determining motives behind BPC, and streamlining and internal integration of business processes. There are other several key factors in the technology dimension: information accuracy and timeliness, integration of data between internet and other applications, accessibility and flexibility of software applications, and security of data. Additionally, more efforts should be directed towards strengthening the communication between the technical support staff and the employees to inform employees in advance of scheduled system downtime, and of the status of ongoing projects. Finally, providing proper training to the employees is the most influencing factor in the people dimension.

8.4 Considerations for policy makers

The lessons learned from this research have brought into focus some of the needs of public organisations with regard to e-government. Therefore, this work provides significant insight for decision-makers in this arena. By considering perceptions of employees towards e-government projects at their organisations, this work provides a starting point for policy makers who need to assess EGR, a principal approach to advance e-government program in such organisations.

Ultimately, based mainly on observations and interviews in addition to the quantitative findings in each organisation, this research has revealed the necessity for a detailed e-government strategy encompassing several components (highlighted in the developed research framework). Building awareness of such strategy in each organisation proved to be important. Further, involving employees throughout the different stages of software

systems development should not be overlooked for two reasons: their input would contribute a great deal in producing efficient systems due to their experience, and, having a role in participating and deciding new systems would motivate them to feel part of the project; thus reducing their resistance to change.

Moreover, further initiatives should be undertaken to digitise information in order to minimise the workload since a large part of the work is still performed manually. Besides, integrating website activities with the internal processes should be among the top priorities in any e-government strategy.

Finally, there should be different channels to assess citizens' and employees' perceptions towards e-government in each organisation to create rooms for improvement, and to foster communication between policy makers and these two major sectors of stakeholders.

8.5 Limitations of the thesis

The study investigated four case studies of public organisations in different sectors. One of the main sources of data was through distributing a questionnaire to the employees using ICT systems within these organisations. The main limitation lies in the small sample size in each case study. Unfortunately, this was out of the researcher's control because the number of employees working on computers is relatively small in Egyptian public organisations. Even so, the sample used in the questionnaire reflected to a large extent employees in each organisation because it covered a wide demographic spectrum. In addition, the sample in each organisation represented a relatively high percentage of the population (81 of 130 at MD, 55 of 70 at TUNC, 48 of 200 at MOI, and 36 of 36 at PH). For further validity, the researcher triangulated questionnaire results with the qualitative data gathered from different data collection methods.

Furthermore, the data collection method that produced the strength and effect of relationship among the dimensions of the framework depended on the opinions of the employees, without considering other stakeholders, such as citizens and business partners. However, since the thesis main theme is directed towards assessing the back office of public organisations, employees and top management are the stakeholders best acquainted with such issues.

Another limitation of the research is the possibility that employees feedback could be subject to criticism due to several reasons: (i) culture: Egyptians are always reluctant to reveal any negative attitude when responding to surveys, and especially towards issues

related to their work environment despite assuring them of the anonymous nature of the questionnaire; (ii) skills and awareness: participants have different levels of expertise and familiarity with the research topic; and (iii) questionnaire's length: which could lead to less valid answers due to fatigue or unwillingness of participants to seriously answer a large number of questions.

Finally, while the researcher tried to get as much data as possible from each case study, sometimes some of the required information could not be accessible due to confidentiality and/or bureaucratic reason.

8.6 Recommendations for future research

This research serves as a starting point for greater research into assessment of E-Government Readiness (EGR) of public organisations. Several areas of interest were revealed during the research that would benefit further studies. One venue would be to conduct a longitudinal assessment study on the same organisations. This could involve a five or ten year analysis to spot changes in perceptions of both employees and top management towards e-government. The ability to conduct periodical assessment would provide valuable insight into the development of e-government, and would enable spotting both positive and negative changes over time. In this way, it would be easier to rectify e-government path in each of the four organisations.

Another valuable area of future research would be to include more case studies to cover other pivotal sectors in Egypt such as education, transportation, civil status (provides issuing ID and birth certificates), vehicles licenses services, law, culture, etc. Such research would reflect further EGR status of Egypt since it would encompass other important sectors in the country.

As shown throughout the thesis, four cases were investigated. Apart from the Ministry of Investment, the three other cases were samples of a number of organisations in their corresponding sectors. Of these three cases, two were considered successful: one representing municipalities (Montaza District), and another representing tax units (Tax Unit for Non-Commercial Professions). The third one, which was not as successful, was a public hospital in an early stage in terms of e-government representing public hospitals. Future research would include cases at different stages of e-government application in each of the above three sectors. This would lead to more objectivity in the findings because it will not be limited to a particular e-government stage in each sector. Furthermore, comparing cases at different e-government stages in the same sector would emphasise and confirm the areas affecting the success of e-government. To a great

extent such approach would avoid doubts concerning dissimilar challenges, objectives, and other issues stemming from differences between sectors.

It would be also beneficial to generalise the research findings to produce a generic EGR assessment framework that could be applied in any context. This could be reached through conducting the same study in other developed and developing countries to test the developed framework. Further work to be published will be focusing on undertaking similar studies in the United Kingdom, Greece, Dubai, and Algeria.

For researchers requesting to undertake the same study in different countries, it is recommended that they follow the same steps followed in the empirical research of this study. They should select first the public organisations that could best represent a country, then collect data through the same data collection methods: interviews, questionnaire distributed to employees, documents, archival records, and observation of the workplace. Changes could arise in the constructs under the four main dimensions of the EGR framework: strategy, processes, technology, and people; but results could not lead to additional internal factors affecting EGR since the research framework encompassed all dimensions related to an information system development and implementation in general and to e-government in particular.

Finally, it is recommended that more research is conducted in the e-administration dimension of e-government which is usually overlooked, especially in developing countries. Moreover, it is important to take into account the view of the employees working in the organisations under investigation. It is clear from the review of the literature that such view is rarely considered.

8.7 Epilogue

The findings of this thesis offer not only a valuable and practical resource for those researchers wishing to further enquire into e-government readiness, but also provide invaluable insight into the working environment of Egyptian public organisations highlighting the experience of the researcher during conducting the study, and a critique of the overall research process. By utilising the findings of this study, decision-makers would be better positioned to understand the impact of their policies on the perceptions of employees, and on the overall e-government implementation in each organisation. The conclusions drawn from this study could be used as a tool to enable a greater degree of awareness of previously unconsidered issues while formulating new e-government projects. This may ultimately influence the degree of effectiveness of and acceptance by

those affected by those decisions, and may serve in understanding the main factors, which will eventually help in realising progress and success of these projects.

As has been concluded by this research, E-Government Readiness (EGR) of Egyptian public organisations was assessed using a framework that comprised the main dimensions affecting EGR, which are: (i) strategy, (ii) processes, (iii) technology, and (iv) people. There were a number of factors or measuring constructs under each dimension. The framework developed showed the weight of each dimension in affecting EGR, in addition to the relationship between the above four dimensions.

Findings revealed that processes, technology, and people had a high impact on EGR as compared to the modest effect of strategy. This highlights the need to investigate means to promote e-government within each public organisation (through training, involvement, compatibility between different top management levels), and to set a complete e-government strategy encompassing all the components highlighted in the framework.

Furthermore, by highlighting the key factors in each dimension, policy makers would be able to recognise the importance of those factors in order to put them among the first priorities. Concerning the effect of strategy on the three other dimensions, results showed that strategy had a modest impact on technology and processes, and a high impact on people.

Based on the findings, the most important facts that the researcher concluded were that funding sources were not proved to be among the key factors in the strategy dimension. This was not expected in the case of a developing country where it is always assumed that funds are the main reason that hinders e-government development. Having a clear view of the drivers, challenges of e-government development were of great value. Moreover, results shed the light on the importance of leadership in an e-government strategy to ensure top management support and to foster e-government use in different areas in the organisations. Findings showed also that one of the main factors that hinder the development of e-government in Egypt is the lack of integration of ICT and business processes between public organisations. According to (Ghuitas, 2009), the challenge to such integration is not funds or technical procedures, but is mainly related to the mentality of responsibles unable to understand and cope with that change due to: (i) lack of interest; (ii) conflict of interest; (iii) loss of power; or (iv) scary feeling of the fact of easiness and freedom of exchanging data. More emphasis should be also directed towards conducting regular evaluation of e-government, particularly focusing on the feedback of citizens and employees.

Findings demonstrated also that in old organisation, it is difficult for any e-government strategy to have a strong effect on changing business processes due to the rigid nature of old organisations which constitutes a great challenge to incorporate change.

It is recommended to conduct further research in the same case studies and in more Egyptian organisations as well, and to consider such research an on-going process to be undertaken regularly.

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Appendix A: E-Readiness Models

Model	IT Infrastructure	HR	Policies and Regulations	Environment	E-government Transformation
Computer McConnell International (MI) (Luyt, 2006; Bui et al., 2003)	√	√	√	√	○ Availability of online government services
Country Development Gateway (CDG) (Bridges.org, 2005)	√		√	√	
Crenshaw and Robinson (C&R) (Bridges.org, 2005)	√	√		√	
Economist Intelligence Unit (EIU) (Bridges.org, 2005)	√	√	√	√	
Information Society Index (IDC) (Bridges.org, 2005).	√	√		√	
Metric-Net-E-Economy Index (M-N) (Bridges.org, 2005).	√	√		√	○ Government use of ICT for its own services & processes
Mosaic (MQ) (Bridges.org, 2005)	√	√	√	√	○ Government use of ICT for its own services & processes
Pacific Economic Cooperation (APEC) (Luyt, 2006; Budhiraja and Sachdeva, 2002; Bui et al., 2003)	√	√	√	√	
The Computer System Policy Project (CSPP) (Budhiraja and Sachdeva, 2002; Bui et al., 2003)	√	√	√	√	○ Availability of online government services ○ Government use of ICT for its own services & processes
World Economic Forum (WEF) (Budhiraja and Sachdeva, 2002)	√		√		

Appendix B: E-Government Readiness (EGR) Questionnaire

Thank you for taking the time to answer this questionnaire. This questionnaire is intended to measure the Organisation's readiness for implementing electronic government. The data collected by this questionnaire is exclusively for research purposes only, and will not be used or distributed elsewhere.

The questionnaire is comprised of six parts. They should be answered in order.

Please take a moment to familiarize yourself with the following terms and definitions used in the questionnaire.

Terms and Definitions

Information Technology (IT):
Computers, software, and the networks that connect them, but not the phone or fax systems.
.

Electronic government (EG):
Applying Information and Communication Technology (ICT) to transform a government internal and external relationships.

Electronic government readiness (EGR):
Ability of a government to adopt e-government

Goals and objectives:
The intended results or outcomes to be achieved. Goals and objectives answer the question, "Where do we want to go?" Goals and objectives are set for short-, mid-, and long-term time horizons.

Strategy:
A roadmap set for an organisation that marks the main directions for integrating its major goals, policies, and action sequences.

Action plan:
Detailed execution steps to be taken in order to reach goals and objectives. Action plan answers the question, "How are we going to achieve our goals and objectives?"

Technology Services Department (TSD):
The functional unit of the Organisation that provides products and services to the Organisation.

Part A

Please read each question carefully and check the response that best expresses your view. If you do not know the answer you should check N/A.

1 = Strongly Disagree 2 = Disagree 3 = Weakly Disagree
4 = Neutral (N) 5 = Weakly Agree 6 = Agree
7 = Strongly Agree NA = Not Applicable or Don't Know

	Strongly disagree			(N)		Strongly agree	NA
1. The Organisation has a well defined strategy for IT	O1	O2	O3	O4	O5	O6 O7	O
2. The Organisation placed a set of goals in its IT strategy	O1	O2	O3	O4	O5	O6 O7	O
3. The Organisation's IT strategy encompasses all Internet activities as one of its major goals	O1	O2	O3	O4	O5	O6 O7	O
4. The Organisation's IT strategy was developed taking the following into consideration:							
a. Determination of real drivers or compelling reasons to develop and implement e-government	O1	O2	O3	O4	O5	O6 O7	O
b. Identification of existing and future challenges to development and implementation of e-government	O1	O2	O3	O4	O5	O6 O7	O
c. IT support for the Organisation goals and objectives	O1	O2	O3	O4	O5	O6 O7	O
d. Organisation's strategies and action plans	O1	O2	O3	O4	O5	O6 O7	O
e. IT investments and operating budgets should be established and approved with consideration of alignment with the Organisation's strategies and plans	O1	O2	O3	O4	O5	O6 O7	O
5. The Organisation's IT strategy includes an action	O1	O2	O3	O4	O5	O6	O

plan	O7	
6. The Organisation's IT action plan was developed taking the following into considerations		
a. Assessment of the current Organisation systems in terms of IT resources (people, applications, technology, facilities, and data)	O1 O2 O3 O4 O5 O6 O7	O
b. Responsibility of all departments and employees involved	O1 O2 O3 O4 O5 O6 O7	O
c. Associated changes in the Organisation's structure	O1 O2 O3 O4 O5 O6 O7	O
d. Establishment and communication of IT policies and procedures to all employees	O1 O2 O3 O4 O5 O6 O7	O
e. Ways of dealing with continuous political, bureaucratic, and technical changes and risks	O1 O2 O3 O4 O5 O6 O7	O
f. Identification of possible internal funding for e-government project	O1 O2 O3 O4 O5 O6 O7	O
g. Identification of possible external funding for e-government project	O1 O2 O3 O4 O5 O6 O7	O
h. Identification of stakeholders involved	O1 O2 O3 O4 O5 O6 O7	O
i. Role of each stakeholder	O1 O2 O3 O4 O5 O6 O7	O
j. Value to be realized on each stakeholder as a result of implementing e-government	O1 O2 O3 O4 O5 O6 O7	O
k. Ways of promoting and building awareness of e-government throughout the Organisation	O1 O2 O3 O4 O5 O6 O7	O
7. The Organisation uses IT …		
a. To reinforce an environment for empowerment and innovation	O1 O2 O3 O4 O5 O6 O7	O
b. To support organisational and employee	O1 O2 O3 O4 O5 O6 O7	O

learning		
c. In all activities and functions of the Organisation	O1 O2 O3 O4 O5 O6 O7	O
8. The people responsible for e-government development in your Organisation do have support and access to the key government officials at the highest levels of the Administration	O1 O2 O3 O4 O5 O6 O7	O

Part B

	Strongly disagree			(N)			Strongly agree	NA
1. During the last several years, there have been experiences of changing business processes in the Organisation as a result of using IT	O1	O2	O3	O4	O5	O6	O7	O
2. There are motives or pressure points behind changing business processes	O1	O2	O3	O4	O5	O6	O7	O
3. In case there was a business process change, the focal areas of process change were determined	O1	O2	O3	O4	O5	O6	O7	O
4. Business processes are defined in the Organisation, or at least in your department	O1	O2	O3	O4	O5	O6	O7	O
5. Business processes are documented in the Organisation, or at least in your department	O1	O2	O3	O4	O5	O6	O7	O
6. There is a direction to streamline business processes in the Organisation, or at least in your department	O1	O2	O3	O4	O5	O6	O7	O
7. There exist a strong integration of business processes between the different Organisation's departments	O1	O2	O3	O4	O5	O6	O7	O
8. The Organisation is highly collaborative with other public agencies in the solution of problems, service delivery, or better work flow	O1	O2	O3	O4	O5	O6	O7	O

	Strongly disagree			(N)			Strongly agree	NA
9. There is provision for Monitoring and Evaluation of e-government initiatives	O1	O2	O3	O4	O5	O6	O7	O
10. There exist regular processes that compare the Organisation's e-government strategy with regard to the actual implementation situation	O1	O2	O3	O4	O5	O6	O7	O
11. The Organisation has metrics about usage of IT by employees?	O1	O2	O3	O4	O5	O6	O7	O
12. The Organisation has metrics about usage of e-government services by citizens?	O1	O2	O3	O4	O5	O6	O7	O
13. There is a dialogue with citizens using the Organisation's electronic services concerning the following:								
a. Perceived usefulness	O1	O2	O3	O4	O5	O6	O7	O
b. Perceived ease of use	O1	O2	O3	O4	O5	O6	O7	O
c. Satisfaction	O1	O2	O3	O4	O5	O6	O7	O
d. Trust	O1	O2	O3	O4	O5	O6	O7	O
14. There is a dialogue with employees using the Organisation's IT resources concerning the following:								
a. Perceived usefulness	O1	O2	O3	O4	O5	O6	O7	O
b. Perceived ease of use	O1	O2	O3	O4	O5	O6	O7	O
c. Satisfaction	O1	O2	O3	O4	O5	O6	O7	O
15. There exists a regular assessment of the impact of e-government initiatives on all stakeholders	O1	O2	O3	O4	O5	O6	O7	O

Part C

Part C-1

Please rate the extent to which the **performance of IT** in your ORGANISATION meets your expectations in each of the following areas. Please read each question carefully and click on the appropriate response.

1 = far short of expectations 2 = short of expectations

3 = slightly short of expectations 4 = meets expectations
5 = slightly exceeds expectations. 6 = exceeds expectations.
7 = greatly exceeds expectations NA = Not Applicable or Don't Know

	Far short of expectations						Greatly exceeds expectations	NA
1. Regarding the **data and information** provided by the Organisation's IT, please rate the following:								
a. Content	O1	O2	O3	O4	O5	O6	O7	O
b. Availability	O1	O2	O3	O4	O5	O6	O7	O
c. Accuracy	O1	O2	O3	O4	O5	O6	O7	O
d. Timeliness	O1	O2	O3	O4	O5	O6	O7	O
e. Convenience	O1	O2	O3	O4	O5	O6	O7	O
f. All Organisation's software applications can share data throughout the Organisation	O1	O2	O3	O4	O5	O6	O7	O
g. All Organisation's software applications can share data with other public agencies	O1	O2	O3	O4	O5	O6	O7	O
h. All Organisation's Internet applications can share data with the Organisation non-Internet applications	O1	O2	O3	O4	O5	O6	O7	O
i. Please rate the **overall** quality **of data and information** provided by the Organisation's IT	O1	O2	O3	O4	O5	O6	O7	O
2. Regarding **software applications** you use as the Organisation employee, please rate the following:								
a. Reliability	O1	O2	O3	O4	O5	O6	O7	O
b. Ease of use	O1	O2	O3	O4	O5	O6	O7	O
c. Accessibility	O1	O2	O3	O4	O5	O6	O7	O
d. Usefulness	O1	O2	O3	O4	O5	O6	O7	O
e. Flexibility	O1	O2	O3	O4	O5	O6	O7	O

f.	Integration of applications over the Organisation	O1 O2 O3 O4 O5 O6 O7	O
g.	Integration of applications between the Organisation and other public agencies	O1 O2 O3 O4 O5 O6 O7	O
h.	The Organisation's Internet applications are designed and developed to work with legacy systems	O1 O2 O3 O4 O5 O6 O7	O
i.	Please rate the **overall** quality of **software applications** in the Organisation	O1 O2 O3 O4 O5 O6 O7	O
3. Regarding the Organisation **Website**, please rate the following:			
a.	Usability	O1 O2 O3 O4 O5 O6 O7	O
b.	Layout	O1 O2 O3 O4 O5 O6 O7	O
c.	Navigation	O1 O2 O3 O4 O5 O6 O7	O
d.	Consistency	O1 O2 O3 O4 O5 O6 O7	O
e.	Content	O1 O2 O3 O4 O5 O6 O7	O
f.	Number of services provided	O1 O2 O3 O4 O5 O6 O7	O
g.	All information is available on the Website	O1 O2 O3 O4 O5 O6 O7	O
h.	Two-way interaction	O1 O2 O3 O4 O5 O6 O7	O
i.	Complete transaction within single Organisation	O1 O2 O3 O4 O5 O6 O7	O
j.	Complete transaction across multiple agencies	O1 O2 O3 O4 O5 O6 O7	O
k.	Please rate the OVERALL quality of the Organisation **Website**	O1 O2 O3 O4 O5 O6 O7	O
4. Regarding the **security measures** provided for IT in the Organisation, please rate the following:			
a.	Protection of data	O1 O2 O3 O4 O5 O6 O7	O
b.	Protection of software applications	O1 O2 O3 O4 O5 O6 O7	O
c.	Safety of data transfer over the Organisation's network	O1 O2 O3 O4 O5 O6 O7	O

d. Access privileges	O1	O2	O3	O4	O5	O6	O7	O
e. Safety of transactions performed through the Organisation Website	O1	O2	O3	O4	O5	O6	O7	O
f. Please rate the OVERALL **security** measures provided for IT in the Organisation	O1	O2	O3	O4	O5	O6	O7	O
5. Regarding the **hardware** in the Organisation, please rate the following:								
a. Efficiency	O1	O2	O3	O4	O5	O6	O7	O
b. Compatibility with other departments in the Organisation	O1	O2	O3	O4	O5	O6	O7	O
c. Compatibility with other public agencies	O1	O2	O3	O4	O5	O6	O7	O
d. Please rate the OVERALL quality of the **hardware** in the Organisation								

Part C-2

Please rate the extent to which the performance of the **Technology Service Department's (TSD's)** staff meets your expectations in each of the following areas.

	Far short of expectations					Greatly exceeds expectations		NA
6. TSD staff does what it promises to do	O1	O2	O3	O4	O5	O6	O7	O
7. TSD staff performs services right the first time	O1	O2	O3	O4	O5	O6	O7	O
8. TSD staff performs promised service independently	O1	O2	O3	O4	O5	O6	O7	O
9. The members of the TSD staff are appropriately qualified (technical skills and expertise) for their jobs	O1	O2	O3	O4	O5	O6	O7	O
10. TSD staff has the expertise required to create or evaluate for purchase the information technologies needed by the Organisation	O1	O2	O3	O4	O5	O6	O7	O
11. When I have a problem, the TSD staff does its	O1	O2	O3	O4	O5	O6	O7	O

best to respond as soon as possible and are always willing to help		
12. When problems occur, the TSD staff solves them in a timely manner	O1 O2 O3 O4 O5 O6 O7	O
13. TSD staff finishes projects on time	O1 O2 O3 O4 O5 O6 O7	O
14. The members of the TSD staff are able to explain new systems/software in a manner that I can understand	O1 O2 O3 O4 O5 O6 O7	O
15. The TSD staff keeps me informed in advance of scheduled system downtime	O1 O2 O3 O4 O5 O6 O7	O
16. The TSD staff keeps me informed of the status of ongoing projects that will affect my job	O1 O2 O3 O4 O5 O6 O7	O
17. It is easy for me to communicate with the TSD department	O1 O2 O3 O4 O5 O6 O7	O
18. The TSD staff demonstrates good interpersonal communication skills in their interactions with other people	O1 O2 O3 O4 O5 O6 O7	O
19. I am involved in the design, development, & changes of IT systems	O1 O2 O3 O4 O5 O6 O7	O
20. The appropriate hardware, software, and people required to support the performance of my work are always available	O1 O2 O3 O4 O5 O6 O7	O

Part D

Part D-1

Please read each question carefully and check the response that best expresses your view. If you do not know the answer you should check N/A.

1 = Strongly Disagree 2 = Disagree 3 = Weakly Disagree
4 = Neutral 5 = Weakly Agree 6 = Agree

7 = Strongly Agree NA = Not Applicable or Don't Know

	Strongly disagree			Neutral			Strongly agree	NA
1. **Overall,** I am satisfied with the Organisation's IT	O1	O2	O3	O4	O5	O6	O7	O
2. **Overall**, there has been a positive impact as to how much my performance was improved by the aid of the Organisation's IT	O1	O2	O3	O4	O5	O6	O7	O
3. I can cope easily with changes in my work processes due to adopting IT in my work	O1	O2	O3	O4	O5	O6	O7	O
4. It is very easy for me to communicate with other departments in (or outside) the Organisation	O1	O2	O3	O4	O5	O6	O7	O
5. It is very easy for me to provide an adequate service to citizens seeking services from the Organisation	O1	O2	O3	O4	O5	O6	O7	O
6. I like using computers and IT	O1	O2	O3	O4	O5	O6	O7	O

Part D-2

Please rate the extent to which the **IT training** provided to you in the Organisation meets your expectations. Please read each question carefully and click on the appropriate response.

1 = far short of expectations 2 = short of expectations
3 = slightly short of expectations 4 = meets expectations
5 = slightly exceeds expectations. 6 = exceeds expectations.
7 = greatly exceeds expectations NA = Not Applicable or Don't Know

	Far short of expectations					Greatly exceeds expectations		NA
7. I was properly trained on new systems	O1	O2	O3	O4	O5	O6	O7	O
8. The training I was provided was adequate to my needs	O1	O2	O3	O4	O5	O6	O7	O
9. The training I was provided had a positive impact	O1	O2	O3	O4	O5	O6	O7	O

on the performance of my work		
10. I was trained on how to deal with changes in processes due to adopting IT in my work	O1 O2 O3 O4 O5 O6 O7	O
11. I was trained on how to deal with citizens seeking services from the Organisation	O1 O2 O3 O4 O5 O6 O7	O
12. I was involved in the decisions of the training courses that I will have	O1 O2 O3 O4 O5 O6 O7	O
13. I was involved in the evaluation of the training courses that I had	O1 O2 O3 O4 O5 O6 O7	O

Part E

How do you evaluate the e-government readiness state in the Organisation?

O1 O2 O3 O4 O5 O6 O7

Extremely unready Extremely ready

Part F

1. What is your gender?

   Female O Male O

2. In which category does your age fall?

   20-30 O 31-40 O 41-50 O More than 50 O

3. What's your current position?

   Official in charge O Team leader O Head of department O General manager O Others O ----------

4. What is the highest formal education you have completed?

   University Graduate O High/Technical Institute O School Graduate O Others O ----------

5. Please check the department in which you work:

a. Customer Service	O
b. Accounting	O
c. Electricity	O
d. Clerical	O
e. Archiving	O
f. Human Resources	O
g. Legal	O
h. Technology Services	O
i. Utilities Administration	O
j. Others:	O

6. How many hours per week do you work for the Organisation?
_____ hours

7. How many hours per week do you use IT to perform your Organisation work?
_____hours

8. How long have you worked for the Organisation?
_____years _____ months

9. How long have you been in your current job?
_____years _____ months

10. How many years of experience do you have using IT?
_____years _____ months

11. For each of the following software applications:
Please check column: A if you use the software at work.
B if you would like to have more training for the software.

Software applications	A Software used	B More training
a. Word	O	O
b. Excel	O	O
c. PowerPoint	O	O
d. Project Management	O	O
e. Geographic Information System (GIS)	O	O
f. Access	O	O
g. Others:	O	O

12. Please check all the training that you have completed.

a.	Windows	O
b.	Word	O
c.	Excel	O
d.	PowerPoint	O
e.	Project Management	O
f.	Geographic Information System (GIS)	O
g.	Access	O
h.	Others:	O

13. Do you have access to the following technologies?

Personal Computer O Internet O email O

14. How do you rate your skills in using the following technologies?

	Need substantial improvement						Excellent
Personal Computer	O1	O2	O3	O4	O5	O6	O7
Internet	O1	O2	O3	O4	O5	O6	O7
email	O1	O2	O3	O4	O5	O6	O7
Others:	O1	O2	O3	O4	O5	O6	O7

Appendix C: Interviews' Questions

1. Organisation . . . . . .
   Address . . . . . .
   City . . . . . .

2. Please list the three (3) services of higher demand from the public, indicating if typical customer associated with each is a citizen (G2C) or a business (G2B), or a governmental agency (G2G):

	Service	**Typical Customer**
S1		
S2		
S3		

3. What is the number of departments and their names?

4. What is the number of employees? What is the number of prospect respondents (without technicians & helping services)?

5. Is there a technology services department? How many employees in it? What are their main tasks?

6. What are the names of the software applications in the Agency?

7. Is there a government wide Intranet? If yes, does the Agency use it? In which tasks?

8. Does the Agency participate in the national e-government wide portal?

9. Is there intranet connectivity and digital interaction between the central and local governments?

10. What is the percentage of secondary government units (departments, divisions, branches) with access to the Internet?

11. What are the compelling reasons for the Agency to develop and implement e-government?

12. What are the primary e-government applications to be developed by the Agency? (name and URL, if any, their types - G2G, G2C or G2B - , and when they will be available?

13. Do an e-government strategy and an action plan exist for the Agency? If yes, does it relate to the national e-government strategy and action plan? How? (relevant documentation or URL).

14. Is the e-government strategy aligned with the Agency's business strategy?

15. What is the Agency's budget, if any, for e-government applications?

16. Is there any area of the Agency's e-government program being outsourced?

17. How are resources allocated to, or within, the Agency for the development of e-government?

18. Please rate the Agency's average internal capacity to pursue the following information management activities:

Information Activity	Need substantial	Need improvement	Good	Very Good	Excel lent

	improvement				
a. Produce information	O 1	O 2	O 3	O 4	O 5
b. Gather information	O 1	O 2	O 3	O 4	O 5
c. Digitize Information	O 1	O 2	O 3	O 4	O 5
d. Process information	O 1	O 2	O 3	O 4	O 5
e. Analyze information	O 1	O 2	O 3	O 4	O 5
f. Distribute information	O 1	O 2	O 3	O 4	O 5
g. Give public access to information	O 1	O 2	O 3	O 4	O 5
h. Archive information	O 1	O 2	O 3	O 4	O 5

19. During the last three years, have there been experiences of reengineering business process in your agency in order to make it more "citizen-centered"? If yes, state examples including any multi-agency processes, their success with metrics (e.g. reduction in time, steps or cost required to complete desired transaction or red tape procedure).

20. What is the level of awareness of the benefits of e-government in the Agency amongst:

	Need substantial awareness	Need awareness	Medium	High	Very high
a. Policy makers	O 1	O 2	O 3	O 4	O 5
b. Senior managers	O 1	O 2	O 3	O 4	O 5
c. Middle managers	O 1	O 2	O 3	O 4	O 5
d. Other civil servants	O 1	O 2	O 3	O 4	O 5

21. In general, describe what best characterizes the provision of the Agency's government services on line

a. No services online	O
b. Only information available on line	O
c. One way interaction possible	O
d. Two-way interaction possible	O
e. Complete transaction possible within single agency	O
f. Complete transaction across multiple agencies	O

22. If there is provision for monitoring and evaluation of e-government initiatives, how often does it take place? And in which areas?

23. Does your agency have metrics about usage of e-government services? If yes, what is the usage of online government for the three services identified earlier (S1, S2, and S3), and is there any data over time?

24. In terms of the Agency communications with the public, is there an active communication strategy for e-government?

25. Is there a mechanism by which the public can provide feedback on online services and influence the continued development of the Agency's e-government offering?

26. Are citizens able to access online documents related to issues currently being decided? If yes, provide examples with URL.

27. Are citizens able to communicate electronically with the Agency's documents' cycle and officials? If yes, provide examples with URL.

28. What are the main existing and future challenges to the development and implementation of **e-government** (*Applying Information and Communication Technology 'ICT' to transform a government internal and external relationships*)?

29. Please rate the Agency's average internal capacity to pursue the following:

Information Activity	Need substantial improvement	Need improvement	Good	Very Good	Excel lent
i. Quality of software applications	O 1	O 2	O 3	O 4	O 5
j. Quality of the Agency's website	O 1	O 2	O 3	O 4	O 5
k. Quality of IT security	O 1	O 2	O 3	O 4	O 5
l. Quality of hardware	O 1	O 2	O 3	O 4	O 5

30. How do you evaluate e-government **readiness** (*ability to adopt e-government*) in the Ministry?

31. Please rank the following factors in terms of their importance on e-government readiness in the Ministry:

	Strategy
	People
	Technology
	Processes (change in business processes & conduct periodic evaluation on e-government initiatives)

Appendix D: Final Factor Analysis

I. Montaza District (MD)

1. Strategy

	Factor				
	Leadership – Stakeholders - Promotion	Funding - Stakeholders' Identification	Objectives - Accountability	Strategic Alignment	IT Strategy
IT Strategy	-.005	-.033	-.006	-.063	**.908**
Strategy:Goals 2	.088	.407	.317	-.080	.268
Strategy: Motives	-.165	.259	**.510**	.460	.069
Strategy: Challenges	.206	.147	.022	.409	-.090
Strategy: Strtgic Align 1	.047	.252	**.776**	.092	.027
Strategy: Strtgic Align 2	.377	.077	.242	**.634**	.019
Strategy: Strtgic Align 3	-.033	.497	.005	.361	-.056
Strategy: Action Plan – Org. - Accountability	.123	.115	**.676**	.469	.087
Strategy: Action Plan – Org. – Leadership	**.672**	.199	.068	.094	.001
Strategy: Action Plan – Funding -- Internal	-.092	**.753**	.106	-.062	-.083
Strategy: Action Plan – Funding -- External	.193	**.736**	-.007	.337	-.032
Strategy: Action Plan – Identif. of stkeholdrs	.038	**.735**	.230	.161	.049
Strategy: Action Plan – Role of each stkeholdr	**.722**	-.118	.083	.178	.382

Strategy: Action Plan – Value on each stkeholdr	**.617**	.043	-.012	.241	-.087
Strategy: Action Plan – Promotion	**.919**	-.123	.218	-.037	-.059
Strategy: Action Plan – Org. -- Leadership 2	.220	-.030	**.733**	-.037	-.076

Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 7 iterations. Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others. Eigenvalues: 4.375, 2.678, 1.756, 1.365, and 1.132

2. Processes

	Factor		
	Evaluation of Citizens Feedback	Evaluation of Employees Feedback	Business Process Change (BPC)
Processes: BPC – Define BPs	-.096	-.033	**.876**
Processes: BPC – Document BPs	.106	.160	**.584**
Processes: BPC – Streamline BPs	.112	.097	**.813**
Processes: Evaluation – Citizens feedback – PU	**.774**	.337	.070
Processes: Evaluation – Citizens feedback – PEOU	**.851**	.361	.017
Processes: Evaluation – Citizens feedback -- Stsfction	**.926**	.320	.043
Processes: Evaluation – Citizens feedback -- Trust	**.548**	.435	.125
Processes: Evaluation – Employees feedback – PU	.283	**.693**	.089

Processes: Evaluation – Employees feedback – PEOU	.280	**.718**	.067
Processes: Evaluation – Employees feedback -- Stsfction	.290	**.778**	.122
Processes: Evaluation – Impact on stkhlders	.285	**.640**	.067

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 5.075, 2.053, and 1.045

3. Technology

	Factor				
	Web Quality	Info Quality - Sys. (Integration)	Tech. Support	Sys. Quality	Security
Tchnlgy: IS Structure -- Info quality -- Content	.330	**.681**	.206	.158	.213
Tchnlgy: IS Structure – Info quality -- Availability	.210	**.818**	.142	.116	-.010
Tchnlgy: IS Structure -- Info quality -- Accuracy	.281	**.782**	.229	.145	.136
Tchnlgy: IS Structure -- Info quality -- Timeliness	.184	**.773**	.100	.187	.169
Tchnlgy: IS Structre -- Info quality -- Convenience	.288	**.670**	.248	.155	-.008
Tchnlgy: IS Structure – Info quality – Vert. integ.	.083	**.676**	-.046	.091	.089
Tchnlgy: IS Structure – Info quality – Horiz. Integ.	.433	**.629**	-.022	.013	.078

Tchnlgy: IS Structure – Info quality	.156	**.768**	.174	.144	.194
Tchnlgy: IS Structure -- Sys. quality -- Reliability	.203	.324	.199	**.589**	.370
Tchnlgy: IS Structure -- Sys. quality -- Ease of use	.179	.270	.113	**.735**	.263
Tchnlgy: IS Structure -- Sys. quality -- Accessibility	.384	.273	.229	**.546**	.323
Tchnlgy: IS Structure -- Sys. quality -- Usefulness	.388	.234	.064	**.623**	.026
Tchnlgy: IS Structure -- Sys. quality -- flexibility	.320	.422	.143	**.596**	.087
Tchnlgy: IS Structure – Sys. quality – Horiz. integ.	.279	**.658**	.028	.183	.264
Tchnlgy: IS Structure – Sys. quality – Intrnt integ.	.296	**.702**	.165	.093	.161
Tchnlgy: IS Structure -- Sys. quality	.076	**.566**	.071	.283	-.032
Tchnlgy: IS Structure – Web quality -- Usability	**.761**	.227	.132	.387	.205
Tchnlgy: IS Structure – Web quality -- Layout	**.831**	.119	.269	.283	.033
Tchnlgy: IS Structure – Web quality -- Navigation	**.816**	.191	.158	.300	.064
Tchnlgy: IS Structure – Web quality -- Consistency	**.791**	.294	.119	.382	.090
Tchnlgy: IS Structure – Web quality -- Content	**.869**	.170	.133	.143	.190

Tchnlgy: IS Structure – Web quality – No. of services	**.843**	.230	.065	.090	.139
Tchnlgy: IS Structure – Web quality -- Stge1	**.817**	.255	.069	.008	.182
Tchnlgy: IS Structure – Web quality -- Stge2	**.670**	.288	.165	-.050	.133
Tchnlgy: IS Structure – Web quality -- Stge3	**.718**	.300	.086	.009	.327
Tchnlgy: IS Structure – Web quality -- Stge4	**.673**	.309	.199	-.005	.242
Tchnlgy: IS Structure -- Web quality	**.729**	.292	.081	.147	.222
Tchnlgy: IS Structure – Security -- Data protection	.347	.050	.324	.207	**.815**
Tchnlgy: IS Structure – Security -- S/W protection	.306	.186	.271	.331	**.743**
Tchnlgy: IS Structure – Security -- Access prvlgs	.317	.358	.252	.012	**.674**
Tchnlgy: IS Structure – Security	.348	.330	.298	.284	**.536**
Tchnlgy: IS Structure – H/W -- Quality	.345	.233	.180	.367	.013
Tchnlgy: IS Structure – H/W – Vert. integ.	.250	.308	.221	.124	.114
Tchnlgy: IS Structure – H/W – Horiz. integ.	.385	.368	.036	-.061	-.055
Tchnlgy: IS Structure – H/W	.154	.307	.145	.326	.297
Tchnlgy: Tech. Supp. & Dev. -- Reliability1	.181	.122	**.809**	.026	.184

Tchnlgy: Tech. Supp. & Dev. -- Reliability2	.021	.183	**.836**	.100	.090
Tchnlgy: Tech. Supp. & Dev. -- Reliability3	.052	.221	**.796**	-.044	.142
Tchnlgy: Tech. Supp. & Dev. -- Competence1	.141	.045	**.652**	.288	.288
Tchnlgy: Tech. Supp. & Dev. -- Responsiveness	.085	.047	**.653**	.186	.041
Tchnlgy: Tech. Supp. & Dev. -- Timeliness1	-.017	.063	**.679**	.061	-.067
Tchnlgy: Tech. Supp. & Dev. -- Timeliness2	.276	.238	**.587**	-.060	-.051
Tchnlgy: Tech. Supp. & Dev. -- Comm.1	.209	.130	.466	.101	.217
Tchnlgy: Tech. Supp. & Dev. -- Comm.3	.269	.389	.312	.032	.340
Tchnlgy: Tech. Supp. & Dev. -- Comm.4	.112	-.004	**.613**	.192	.191
Tchnlgy: Tech. Supp. & Dev. -- Comm.5	.149	.020	**.786**	-.003	.127
Tchnlgy: Tech. Supp. & Dev. -- Commitment	.375	.203	.124	.181	.167
Tchnlgy: Tech. Supp. & Dev. -- Access	.116	.257	.296	.274	-.035

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 7 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 22.012, 4.657, 3.379, 2.322, 2.079, 1.613, 1.438 and 1.222

4. People

	Factor		
	HR Training & Development	Impact - Customer Service Skills	Skills
People: Impact on employees	.206	**.753**	.006
People: Skills – Adapt. to change	-.030	.417	**.713**
People: Skills – Cust. Serv.	.145	**.702**	.208
Like Computers	.083	-.016	**.757**
People: HR Train. & Dev.1	**.826**	.012	.012
People: HR Train. & Dev.2	**.925**	.153	.089
People: HR Train. & Dev.3	**.910**	.159	.144
People: HR Train. & Dev.4	**.849**	.184	.137
People: HR Train. & Dev.5	**.782**	.199	-.081
People: HR Train. & Dev.6	**.852**	.153	.039
People: HR Train. & Dev.7	**.854**	.115	-.045

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 5.790, 1.871, and 1.146

II. Tax Unit for Non-Commercial Professions (TUNC)

1. Strategy

	Factor				
	Action Plan – Goals - Challenges - Stakeholders	Resource Alloc. – Accountability – Structure - Policies & Procedures	Motives - IT Budget Alignment	Stakeholders' Identification	Strategy & Action Plan Alignment - Leadership
Strategy: Action Plan	**.903**	.238	-.164	.150	-.034
Strategy:Goals 2	**.661**	.304	.034	.475	-.428
Strategy: Motives	.333	.211	**.720**	.404	.116
Strategy: Challenges	**.855**	.149	.381	.095	.143
Strategy: Strtgic Align 2	.322	.384	.363	.267	**.657**
Strategy: Strtgic Align 3	.028	.192	**.874**	.129	.374
Strategy: Action Plan – Org. - Rsrce alloc	-.110	**.834**	.036	.405	.274
Strategy: Action Plan – Org. - Accountability	.257	**.884**	.118	-.041	.183
Strategy: Action Plan – Org. - Structure	.173	**.800**	.482	.162	-.128
Strategy: Action Plan – Org. – Est. & imp of policies & procedures	.445	**.736**	.130	.179	.365
Strategy: Action Plan – Org. – Leadership	.075	.383	.422	.197	**.732**
Strategy: Action Plan – Identif. of stkeholdrs	.268	.034	.273	**.848**	.099
Strategy: Action Plan – Role of each stkeholdr	**.922**	.013	.283	.156	.084
Strategy: Action Plan – Value on each stkeholdr	**.907**	.126	.063	.211	.217

Strategy: Action Plan – Promotion	.273	.410	.149	**.772**	.249

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 10 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 7.927, 2.592, 1.452 and 1.088

2. Processes

	Factor		
	Evaluation of Feedback & Impact of Stakeholders	Business Process Change (Definition & Integration)	Evaluation of E-Government & Use of Employees
Processes: BPC	.092	-.093	.427
Processes: BPC – Motives of BPC	-.655	.310	-.201
Processes: BPC – Focal areas of BPC	-.791	.320	.096
Processes: BPC – Define BPs	.314	**.892**	-.103
Processes: BPC – Document BPs	-.834	.230	.125
Processes: BPC – Vertical integration	-.409	**.808**	.105
Processes: BPC – Horizontal integration	-.168	**.505**	-.812
Processes: Evaluation	-.267	.491	**.596**
Processes: Evaluation – Design/reality gap	.166	.447	**.864**
Processes: Evaluation – Use of employees	-.513	.274	**.782**
Processes: Evaluation – Citizens feedback – PU	**.918**	-.182	.022

Processes: Evaluation – Citizens feedback – PEOU	**.924**	-.072	.077
Processes: Evaluation – Citizens feedback -- Stsfction	**.924**	-.072	.077
Processes: Evaluation – Citizens feedback -- Trust	**.947**	.226	.025
Processes: Evaluation – Employees feedback – PU	**.881**	.180	-.064
Processes: Evaluation – Employees feedback – PEOU	**.973**	-.072	.044
Processes: Evaluation – Employees feedback -- Stsfction	**.881**	-.149	-.014
Processes: Evaluation – Impact on stkhlders	**.947**	.226	.025

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 9.401, 3.103, 2.209, 1.956 and 1.099

3. Technology

	Factor							
	Inf. & Sys. Quality	Website (Content) – Security - H/W	Tech. Support	Website (Usability)	Website Quality - S/W Security	Website (Interactivity) – Tech. Support (Reliability)	Tech. Support (Competence)	Tech. Support (Comm.)
Tchnlgy: IS Structure -- Info quality -- Accuracy	**.860**	.154	.373	-.080	-.169	.163	-.166	.097
Tchnlgy: IS Structre -- Info quality -- Convenience	**.648**	.160	.289	-.280	-.457	.258	-.336	-.061
Tchnlgy: IS Structure – Info quality – Vert. integ.	**.741**	-.141	.240	.132	-.420	-.091	.221	.350
Tchnlgy: IS Structure – Info quality – Intrnt integ.	**.584**	-.280	.413	.356	.314	.137	-.032	.406
Tchnlgy: IS Structure – Info quality	**.919**	.153	.065	.036	-.016	-.051	.347	.055
Tchnlgy: IS Structure -- Sys. quality -- Reliability	**.952**	-.072	-.215	.061	-.108	-.002	.107	.122
Tchnlgy: IS Structure -- Sys. quality -- Ease of use	**.904**	-.188	.056	.198	-.067	-.199	-.248	.018
Tchnlgy: IS Structure -- Sys. quality -- Accessibility	**.845**	-.085	.084	-.090	-.205	-.309	-.274	-.223
Tchnlgy: IS Structure -- Sys. quality -- Usefulness	**.938**	.036	.117	-.134	.004	.209	.030	-.207
Tchnlgy: IS Structure -- Sys. quality -- flexibility	**.902**	-.156	.236	.185	.214	-.003	-.158	-.021
Tchnlgy: IS Structure – Sys. quality – Vert. integ.	**.973**	-.149	-.100	.111	.021	-.029	-.082	-.018
Tchnlgy: IS Structure – Sys. quality – Horiz. integ.	**.770**	.184	.150	-.231	-.078	.509	.102	-.150
Tchnlgy: IS Structure – Sys. quality – Intrnt integ.	**.759**	-.037	.479	.290	-.049	.243	-.210	-.053

Tchnlgy: IS Structure – Web quality -- Usability	.222	.109	.322	**.780**	.460	.024	.123	-.003
Tchnlgy: IS Structure – Web quality -- Layout	-.190	**.664**	.443	.395	.272	.139	-.232	-.153
Tchnlgy: IS Structure – Web quality -- Navigation	.004	.382	.113	**.872**	-.225	-.174	-6.14E-005	.009
Tchnlgy: IS Structure – Web quality -- Consistency	.015	.316	.210	**.775**	.368	-.049	-.313	.140
Tchnlgy: IS Structure – Web quality -- Content	-.005	**.709**	.265	.358	.221	-.073	-.493	-.048
Tchnlgy: IS Structure – Web quality – No. of services	.149	-.105	.420	.341	.291	**.757**	-.124	.021
Tchnlgy: IS Structure – Web quality -- Stge1	.313	**.708**	.027	.046	.006	.301	.263	.280
Tchnlgy: IS Structure – Web quality -- Stge2	-.021	.078	.319	-.080	.090	**.933**	.068	.035
Tchnlgy: IS Structure – Web quality -- Stge3	-.199	-.098	-.120	-.055	**.853**	.452	-.042	-.002
Tchnlgy: IS Structure -- Web quality	.074	.419	.059	.178	**.863**	.047	.181	.058
Tchnlgy: IS Structure – Security -- Data protection	-.164	**.810**	.099	.067	.316	-.006	.277	-.354
Tchnlgy: IS Structure – Security -- S/W protection	-.446	.172	-.396	.044	**.741**	.066	.245	.011
Tchnlgy: IS Structure – Security -- Data transfer	.111	**.818**	.250	.293	.158	-.045	.240	-.293
Tchnlgy: IS Structure – Security -- Access prvlgs	-.124	**.609**	-.021	.430	.464	-.417	-.193	-.037
Tchnlgy: IS Structure – Security	.092	**.824**	.144	.398	.032	-.097	.218	.276

Tchnlgy: IS Structure – H/W -- Quality	-.478	**.822**	.001	.163	-.019	-.107	-.236	.040
Tchnlgy: IS Structure – H/W – Vert. integ.	.017	**.914**	.085	.083	-.204	.225	-.127	.206
Tchnlgy: IS Structure – H/W – Horiz. integ.	-.079	**.930**	.268	-.097	-.148	.074	.141	.033
Tchnlgy: IS Structure – H/W	-.084	**.943**	.127	-.001	.220	.063	-.175	.069
Tchnlgy: Tech. Supp. & Dev. -- Reliability1	-.179	.217	.392	-.224	.178	**.613**	.316	.209
Tchnlgy: Tech. Supp. & Dev. -- Reliability2	.149	.202	**.553**	-.210	.141	.440	.292	.277
Tchnlgy: Tech. Supp. & Dev. -- Reliability3	.157	.249	**.846**	-.039	.082	.417	.126	.031
Tchnlgy: Tech. Supp. & Dev. -- Competence2	-.294	-.036	.222	-.189	.206	.137	**.874**	.043
Tchnlgy: Tech. Supp. & Dev. -- Responsiveness	.175	.121	**.912**	.222	.048	.203	.102	-.138
Tchnlgy: Tech. Supp. & Dev. -- Timeliness1	.012	.061	**.949**	.128	-.216	.090	.019	-.153
Tchnlgy: Tech. Supp. & Dev. -- Timeliness2	.161	.169	**.662**	.200	-.468	.091	.436	.222
Tchnlgy: Tech. Supp. & Dev. -- Comm.1	-.377	.235	.134	.416	.083	.192	.191	**.729**
Tchnlgy: Tech. Supp. & Dev. -- Comm.2	.197	.326	**.854**	.206	.090	.160	.125	.184
Tchnlgy: Tech. Supp. & Dev. -- Comm.3	.254	.289	**.812**	.200	-.178	-.074	-.166	.297
Tchnlgy: Tech. Supp. & Dev. -- Comm.4	.207	.149	.363	**.738**	-.152	.184	-.306	.328
Tchnlgy: Tech. Supp. & Dev. -- Comm.5	-.079	.477	**.597**	.371	-.239	.179	-.346	.253

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 15 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 14.038, 11.184, 5.428, 4.169, 3.964, 2.425 and 1.911

4. People

	Factor		
	HR Training & Development	Skills	Satisfaction - Impact
People: US	.413	.184	**.598**
People: Impact on employees	.125	.177	**.957**
People: Skills – Adapt. to change	.121	**.531**	.449
People: Skills – Integration	.160	**.725**	.165
People: Skills – Cust. Serv.	-.103	**.831**	-.046
People: HR Train. & Dev.1	**.866**	.241	.271
People: HR Train. & Dev.2	**.837**	.191	.225
People: HR Train. & Dev.3	**.753**	.206	.376
People: HR Train. & Dev.4	**.891**	.179	.215
People: HR Train. & Dev.5	**.773**	.160	.010
People: HR Train. & Dev.6	**.732**	-.140	.098
People: HR Train. & Dev.7	**.771**	-.084	.043

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.

III. Ministry of Investment (MOI)

1. Strategy

	Component				
	Strategic Alignment - Stakeholders' Identification – Promotion - Leadership	Challenges - IT Budget Alignment - Leadership (Dealing with Risks) - Internal Funding	Resource Alloc. - External Funding - Stakeholders' Value	Accountability - Policies & Procedures	Action Plan - Goals
Strategy: Action Plan	.452	-.046	-.443	.266	**.737**
Strategy:Goals 2	.111	.100	.110	.117	**.944**
Strategy: Challenges	-.171	**.933**	.159	.038	-.013
Strategy: Strtgic Align 1	**.713**	.377	.420	.371	-.176
Strategy: Strtgic Align 2	**.711**	.116	.146	.303	-.295
Strategy: Strtgic Align 3	.232	**.883**	.291	.133	-.024
Strategy: Action Plan – Org. - Rsrce alloc	.048	-.083	**.904**	.178	-.141
Strategy: Action Plan – Org. - Accountability	.495	.082	.076	**.820**	.160
Strategy: Action Plan – Org. – Est. & imp of policies & procedures	.064	.157	.036	**.966**	-.048
Strategy: Action Plan – Org. – Leadership	-.052	**.584**	-.036	.263	-.729
Strategy: Action Plan – Funding -- Internal	.376	**.548**	.419	.425	.317
Strategy: Action Plan – Funding -- External	.254	.499	**.776**	.244	.095
Strategy: Action Plan – Identif. of stkeholdrs	**.570**	.303	.337	.023	.480
Strategy: Action Plan – Value on each stkeholdr	.292	.126	**.785**	.296	-.109

Strategy: Action Plan – Promotion	**.895**	-.077	.350	.071	.246
Strategy: Action Plan – Org. -- Leadership 1	**.949**	-.004	.017	.166	.209
Strategy: Action Plan – Org. -- Leadership 2	**.908**	-.074	.054	.106	.139
Strategy: Action Plan – Org. -- Leadership 3	**.934**	.060	.164	.209	-.113
Strategy: Action Plan – Org. -- Leadership 4	**.766**	.317	-.163	-.037	.225

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 8.947, 3.505, 2.374, 1.547 and 1.393

2. Processes

	Component			
	Evaluation of Citizens' Usage, Employees & Citizens' Feedback	Business Process Change (BPC) - Evaluation of E-Government	Business Process Change (Motives & Areas)	Business Processes (Documentation)
Processes: BPC	.163	-.400	**.556**	.004
Processes: BPC – Motives of BPC	-.024	.165	**.844**	-.099
Processes: BPC – Focal areas of BPC	-.235	.346	**.856**	.156
Processes: BPC – Define BPs	.079	**.526**	.070	.820
Processes: BPC – Document BPs	-.322	.334	-.218	**.719**
Processes: BPC – Streamline BPs	-.175	**.832**	.012	.351
Processes: BPC – Vertical integration	.029	**.917**	-.018	-.008

Processes: BPC – Horizontal integration	.004	**.673**	.153	.048
Processes: Evaluation	.227	**.858**	.137	.245
Processes: Evaluation – Design/reality gap	.225	**.807**	.357	.024
Processes: Evaluation – Use of citizens	**.531**	.428	-.344	-.604
Processes: Evaluation – Citizens feedback – PU	**.825**	.088	-.232	-.302
Processes: Evaluation – Citizens feedback – PEOU	**.791**	.202	-.237	-.178
Processes: Evaluation – Citizens feedback -- Stsfction	**.908**	-.004	-.364	.139
Processes: Evaluation – Citizens feedback -- Trust	**.854**	.042	-.498	.070
Processes: Evaluation – Employees feedback – PU	**.900**	.074	.206	-.126
Processes: Evaluation – Employees feedback – PEOU	**.925**	.075	.161	-.074
Processes: Evaluation – Employees feedback -- Stsfction	**.900**	.074	.206	-.126

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 7.062, 4.668, 2.509 and 1.332

3. Technology

	Component				
	Info (Integration) - Website Quality – Tech. Support	Website (No. of Services) – Security - H/W – Tech. Support (Reliability)	Info & Sys. Quality	Sys. (Integration) - Website (Transaction) - S/W Security	Website (Consistency)
Tchnlgy: IS Structure – Info quality – Vert. integ.	**.663**	-.101	.326	.034	.230
Tchnlgy: IS Structure – Info quality – Horiz. Integ.	**.832**	.012	.021	-.011	.104
Tchnlgy: IS Structure – Info quality	.479	.212	**.521**	.116	-.011
Tchnlgy: IS Structure -- Sys. quality -- Ease of use	.213	-.163	**.923**	.028	-.005
Tchnlgy: IS Structure -- Sys. quality -- flexibility	-.077	.055	**.963**	-.188	-.073
Tchnlgy: IS Structure – Sys. quality – Vert. integ.	-.289	.359	**.508**	-.645	-.219
Tchnlgy: IS Structure – Sys. quality – Horiz. integ.	-.317	-.415	.019	**.758**	.147
Tchnlgy: IS Structure – Sys. quality – Intrnt integ.	.284	-.007	**.817**	.020	.435
Tchnlgy: IS Structure – Web quality -- Consistency	.122	.468	.064	.254	**.771**
Tchnlgy: IS Structure – Web quality -- Content	**.748**	.218	.270	.096	.481
Tchnlgy: IS Structure – Web quality – No. of services	.305	**.607**	.293	-.011	.589
Tchnlgy: IS Structure – Web quality -- Stge1	.474	**.591**	.072	.214	.523
Tchnlgy: IS Structure – Web quality -- Stge2	**.657**	.172	-.124	.397	.517

Tchnlgy: IS Structure – Web quality -- Stge4	.048	-.160	-.599	**.741**	-.108
Tchnlgy: IS Structure -- Web quality	**.554**	.372	.123	-.120	.627
Tchnlgy: IS Structure – Security -- Data protection	-.030	**.906**	-.261	.220	.056
Tchnlgy: IS Structure – Security -- S/W protection	.407	.174	-.246	**.566**	.115
Tchnlgy: IS Structure – Security -- Data transfer	.016	**.620**	-.053	.421	.147
Tchnlgy: IS Structure – Security -- Access prvlgs	.023	**.941**	-.041	-.043	.142
Tchnlgy: IS Structure – Security	.023	**.902**	.048	.215	.200
Tchnlgy: IS Structure – H/W -- Quality	.340	**.687**	.296	-.490	.098
Tchnlgy: IS Structure – H/W – Vert. integ.	**.835**	.309	.166	.007	.105
Tchnlgy: IS Structure – H/W	.169	**.702**	.064	.042	.180
Tchnlgy: Tech. Supp. & Dev. -- Reliability1	.065	**.813**	-.020	.031	-.031
Tchnlgy: Tech. Supp. & Dev. -- Reliability2	.489	**.833**	.104	.104	-.024
Tchnlgy: Tech. Supp. & Dev. -- Reliability3	.182	**.761**	.087	.035	.084
Tchnlgy: Tech. Supp. & Dev. -- Competence2	**.905**	.296	.110	.090	.102
Tchnlgy: Tech. Supp. & Dev. -- Responsiveness	**.756**	.013	-.007	.338	.086
Tchnlgy: Tech. Supp. & Dev. -- Timeliness1	**.831**	.411	.002	.323	-.003

Tchnlgy: Tech. Supp. & Dev. -- Comm.1	**.727**	.584	.072	.016	.129
Tchnlgy: Tech. Supp. & Dev. -- Comm.2	**.630**	-.077	.431	.165	.160

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 9 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 16.418, 4.589, 3.388, 2.010 and 1.183

4. People

	Component		
	HR Training & Development 1	Satisfaction – Impact - Skills	HR Training & Development 2
People: US	.473	**.810**	-.165
People: Impact on employees	.135	**.810**	.393
People: Skills – Adapt. to change	-.135	**.739**	.493
People: Skills – Integration	-.184	**.698**	-.079
Like Computers	-.118	**.706**	.304
People: HR Train. & Dev.1	**.934**	.013	.273
People: HR Train. & Dev.2	.359	.211	**.825**
People: HR Train. & Dev.3	.284	.193	**.897**
People: HR Train. & Dev.5	.509	.072	**.788**
People: HR Train. & Dev.6	**.944**	-.067	.284
People: HR Train. & Dev.7	**.942**	-.089	.281

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 5.149, 2.895 and 1.194

IV. Public Hospital (PH)

1. Strategy

	Component				
	Motives - Strategic Alignment – Structure – Funding - Leadership	Challenges – Value on Stakeholders	IT strategy - Goals	Role of Stakeholders	Stakeholders' Identification
IT Strategy	.048	-.443	**.776**	.142	-.336
Strategy:Goals 2	.052	.454	**.786**	.210	-.069
Strategy: Motives	**.638**	.425	-.292	.113	-.001
Strategy: Challenges	.439	**.710**	.273	-.102	-.186
Strategy: Strtgic Align 2	**.711**	-.046	-.317	-.505	-.020
Strategy: Strtgic Align 3	**.746**	.099	-.515	.164	-.244
Strategy: Action Plan – Org. - Structure	**.581**	-.139	.172	.357	-.620
Strategy: Action Plan – Org. – Leadership	**.659**	-.126	-.601	-.249	-.080
Strategy: Action Plan – Funding -- Internal	**.673**	-.028	-.368	.467	.119
Strategy: Action Plan – Identif. of stkeholdrs	.455	.118	.038	.496	**.664**
Strategy: Action Plan – Role of each stkeholdr	.475	.323	.317	**.501**	.106
Strategy: Action Plan – Value on each stkeholdr	.351	**.676**	.451	-.306	.195
Strategy: Action Plan – Org. -- Leadership 1	**.514**	-.673	.358	.084	.369
Strategy: Action Plan – Org. -- Leadership 2	**.535**	-.672	.419	-.058	.214

Strategy: Action Plan – Org. -- Leadership 3	**.808**	-.248	.202	-.462	.088
Strategy: Action Plan – Org. -- Leadership 4	**.789**	-.349	.275	.015	-.185

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 9 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 5.371, 3.321, 2.996, 1.649 and 1.331

2. Processes

	Component		
	Business Process Change (BPC)	Evaluation of Employees' Use & Impact on Stakeholders	Evaluation of E-Government
Processes: BPC	**.690**	.222	-.452
Processes: BPC – Motives of BPC	**.813**	.039	-.120
Processes: BPC – Focal areas of BPC	**.668**	.356	-.083
Processes: BPC – Define BPs	**.775**	-.061	.435
Processes: BPC – Streamline BPs	**.825**	-.059	.415
Processes: BPC – Vertical integration	**.794**	.033	.067
Processes: Evaluation	.072	**.556**	.466
Processes: Evaluation – Design/reality gap	.041	.052	**.862**
Processes: Evaluation – Use of employees	-.073	**.904**	.095
Processes: Evaluation – Impact on stkhlders	.156	**.628**	-.035

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations.

Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 3.698, 1.764 and 1.446

3. Technology

	Component					
	Security - H/W – Tech. Support	Info (Convenience) - Sys. Quality – Tech. Support (Comm.)	Info (Timeliness & Internet Integration) - Sys. (Reliability)	Sys. (Usability, Accessibility, Flexibility)	Info (Availability, Accuracy, Vert. Integration)	Info (Horiz. Integration)
Tchnlgy: IS Structure – Info quality -- Availability	.160	.264	.271	.429	**.781**	-.136
Tchnlgy: IS Structure -- Info quality -- Accuracy	.064	.110	-.011	.270	**.924**	.034
Tchnlgy: IS Structure -- Info quality -- Timeliness	.081	.002	**.891**	.052	.198	-.273
Tchnlgy: IS Structre -- Info quality -- Convenience	.363	**.501**	.320	.489	-.063	-.039
Tchnlgy: IS Structure – Info quality – Vert. integ.	.097	.055	.400	.330	**.618**	.454
Tchnlgy: IS Structure – Info quality – Horiz. Integ.	-.058	.391	.065	.334	.250	**.707**
Tchnlgy: IS Structure – Info quality – Intrnt integ.	.031	.229	**.931**	.234	-.054	.106
Tchnlgy: IS Structure -- Sys. quality -- Reliability	-.182	-.147	**.673**	.041	.127	-.125
Tchnlgy: IS Structure -- Sys. quality -- Ease of use	-.305	-.077	.499	**.736**	.193	.067
Tchnlgy: IS Structure -- Sys. quality -- Accessibility	-.015	-.187	.034	**.931**	.273	-.028
Tchnlgy: IS Structure -- Sys. quality -- Usefulness	-.011	-.784	.016	.169	.050	.051
Tchnlgy: IS Structure -- Sys. quality -- flexibility	-.151	.163	.136	**.893**	.187	-.060

Tchnlgy: IS Structure – Sys. quality – Horiz. integ.	**.553**	-.652	.473	.055	.041	-.171
Tchnlgy: IS Structure – Sys. quality – Intrnt integ.	-.090	-.082	.103	.145	.213	-.144
Tchnlgy: IS Structure -- Sys. quality	.171	**.593**	.315	.190	.454	-.024
Tchnlgy: IS Structure – Security -- Data protection	**.929**	.072	-.343	.068	.084	.019
Tchnlgy: IS Structure – Security -- S/W protection	**.872**	-.197	.005	-.186	-.180	.212
Tchnlgy: IS Structure – Security -- Data transfer	**.834**	.077	-.267	.168	-.035	.363
Tchnlgy: IS Structure – Security	-.008	.414	.187	-.573	-.291	-.333
Tchnlgy: IS Structure – H/W -- Quality	**.800**	-.292	.250	-.222	-.032	.291
Tchnlgy: IS Structure – H/W – Vert. integ.	**.873**	.143	.426	-.065	.095	-.080
Tchnlgy: IS Structure – H/W – Horiz. integ.	**.833**	.305	.043	-.087	.055	-.365
Tchnlgy: IS Structure – H/W	**.750**	.411	.013	-.096	.392	-.260
Tchnlgy: Tech. Supp. & Dev. -- Competence1	**.767**	.125	.361	-.075	-.012	.264
Tchnlgy: Tech. Supp. & Dev. -- Competence2	**.765**	.310	-.021	-.043	.260	-.037
Tchnlgy: Tech. Supp. & Dev. -- Comm.1	.332	**.744**	.087	-.240	.208	.195
Tchnlgy: Tech. Supp. & Dev. -- Comm.2	.261	**.896**	.075	.001	.140	-.109
Tchnlgy: Tech. Supp. & Dev. -- Comm.3	.148	.160	-.121	.078	.082	**.929**

Tchnlgy: Tech. Supp. & Dev. -- Comm.4	.203	**.720**	.465	.404	.133	.072
Tchnlgy: Tech. Supp. & Dev. -- Comm.5	**.605**	.383	.191	.384	-.040	.183
Tchnlgy: Tech. Supp. & Dev. -- Commitment	-.231	.026	.119	.086	.223	-.056

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 9 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 8.951, 6.724, 4.414, 2.913, 2.417, 1.972, 1.676 and 1.252

4. People

	Component		
	HR Training & Development 1	Impact – CS Skills – Satisfaction - HR Training & Development 2	Adapt. to Change Skills
People: Impact on employees	.349	**.742**	-.455
People: Skills – Adapt. to change	.048	.332	**.573**
People: Skills – Cust. Serv.	.353	**.658**	.413
Like Computers	.038	**.822**	.400
People: HR Train. & Dev.1	**.917**	.284	-.004
People: HR Train. & Dev.2	**.910**	.252	-.012
People: HR Train. & Dev.3	.369	**.658**	-.015
People: HR Train. & Dev.4	**.878**	.103	.119

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 3 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 5.165 and 1.731

Appendix E: Correlations

I. Montaza District (MD)

1. Strategy

		Leadership - Stakeholders - Promotion	Funding - Stakeholders' Identification	Objectives - Accountability	Strategic Alignment	IT Strategy
Leadership – Stakeholders - Promotion	Pearson Correlation	1	.**234**	**-.001**	**-.060**	.**090**
	Sig. (2-tailed)		.106	.996	.658	.518
	N	60	49	58	56	54
Funding - Stakeholders' Identification	Pearson Correlation	.**234**	1	-.**179**	.2**10**	**-.001**
	Sig. (2-tailed)	.106		.205	.131	.996
	N	49	58	52	53	51
Objectives - Accountability	Pearson Correlation	**-.001**	-.**179**	1	.**219**	**.416(**)**
	Sig. (2-tailed)	.996	.205		.095	.001
	N	58	52	63	59	56
Strategic Alignment	Pearson Correlation	**-.060**	.**210**	.**219**	1	.**234**
	Sig. (2-tailed)	.658	.131	.095		.085
	N	56	53	59	63	55
IT Strategy	Pearson Correlation	.**090**	-.**001**	.**416(**)**	.2**34**	1
	Sig. (2-tailed)	.518	.996	.001	.085	
	N	54	51	56	55	62

** Correlation is significant at the 0.01 level (2-tailed).

2. Processes

		Evaluation of Citizens feedback	Evaluation of employees feedback	Business Process Change (BPC)
Evaluation of Citizens feedback	Pearson Correlation	1	.**265**	**-.025**
	Sig. (2-tailed)		.099	.863
	N	53	40	49
Evaluation of employees feedback	Pearson Correlation	**.265**	1	.**377(*)**
	Sig. (2-tailed)	.099		.013
	N	40	49	43
Business Process Change (BPC)	Pearson Correlation	**-.025**	.**377(*)**	1
	Sig. (2-tailed)	.863	.013	
	N	49	43	62

* Correlation is significant at the 0.05 level (2-tailed).

3. Technology

		Web Quality	Info Quality - Sys. Integration	Tech Support	Sys. Quality	Security
Web Quality	Pearson Correlation	1	**.230**	**.077**	**.342(*)**	**-.354(*)**
	Sig. (2-tailed)		.159	.619	.029	.018
	N	55	39	44	41	44
Info Quality - Sys. Integration	Pearson Correlation	**.230**	1	**.256**	**.207**	**.149**
	Sig. (2-tailed)	.159		.116	.195	.372
	N	39	52	39	41	38
Tech Support	Pearson Correlation	**.077**	**.256**	1	**.143**	**-.393(*)**
	Sig. (2-tailed)	.619	.116		.366	.012
	N	44	39	53	42	40
Sys. Quality	Pearson Correlation	**.342(*)**	**.207**	**.143**	1	**.000**
	Sig. (2-tailed)	.029	.195	.366		.998
	N	41	41	42	54	40
Security	Pearson Correlation	**-.354(*)**	**.149**	**-.393(*)**	**.000**	1
	Sig. (2-tailed)	.018	.372	.012	.998	
	N	44	38	40	40	51

* Correlation is significant at the 0.05 level (2-tailed).

4. People

		HR Training & Development	Impact - Customer Service Skills	Skills
HR Training & Development	Pearson Correlation	1	**.393(*)**	**-.133**
	Sig. (2-tailed)		.012	.440
	N	44	40	36
Impact - Customer Service Skills	Pearson Correlation	**.393(*)**	1	**.433(**)**
	Sig. (2-tailed)	.012		.001
	N	40	60	52
Skills	Pearson Correlation	**-.133**	**.433(**)**	1
	Sig. (2-tailed)	.440	.001	
	N	36	52	60

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

II. Tax Unit for Non-Commercial professions (TUNC)

1. Strategy

		Action Plan – Goals - Challenges - Stakeholders	Rsrce Alloc. – Accountability – Structure - Policies & Procedures	Motives - IT Budget Alignment	Stakeholders' Identification	Strategy & Action Plan Alignment - Leadership
Action Plan – Goals - Challenges - Stakeholders	Pearson Correlation	**1**	**.005**	**.012**	**.500(**)**	**.277**
	Sig. (2-tailed)		.995	.978	.002	.383
	N	12	12	12	12	12
Rsrce Alloc. – Accountability – Structure - Policies & Procedures	Pearson Correlation	**.005**	**1**	**.034**	**.023**	**.042**
	Sig. (2-tailed)	.995		0.970	.944	.896
	N	12	12	12	12	12
Motives - IT Budget Alignment	Pearson Correlation	**.012**	**.034**	**1**	**.279**	**.241**
	Sig. (2-tailed)	.978	0.970		.379	.450
	N	12	12	12	12	12
Stakeholders' Identification	Pearson Correlation	**.500(**)**	**.023**	**.279**	**1**	**.000**
	Sig. (2-tailed)	.002	.944	.379		1.000
	N	12	12	12	13	13
Strategy & Action Plan Alignment - Leadership	Pearson Correlation	**.277**	**.042**	**.241**	**.000**	**1**
	Sig. (2-tailed)	.383	.896	.450	1.000	
	N	12	12	12	13	13

** Correlation is significant at the 0.01 level (2-tailed).

2. Processes

		Evaluation of Feedback & Impact of Stakeholders	Business Process Change (BPC) Definition & Integration	Evaluation of E-Government & Use of Employees
Evaluation of Feedback & Impact of Stakeholders	Pearson Correlation	**1**	**.528(*)**	**.027**
	Sig. (2-tailed)		.021	.954
	N	7	7	7
Business Process Change (BPC) Definition & Integration	Pearson Correlation	**.528(*)**	**1**	**.426**
	Sig. (2-tailed)	.021		.225
	N	7	7	7
Evaluation of E-Government & Use of Employees	Pearson Correlation	**.027**	**.426**	**1**
	Sig. (2-tailed)	.954	.225	
	N	7	7	7

* Correlation is significant at the 0.05 level (2-tailed).

3. Technology

		Inf. & Sys. Quality	Website Content – Security - H/W	Tech. Support	Website Usability	Website Quality - S/W Security	Website Interactivity – Tech. Support Reliability
Inf. & Sys. Quality	Pearson Correlation	**1**	**.182**	**.102**	**.012**	**.078**	**.181**
	Sig. (2-tailed)		.289	.555	.946	.651	.291
	N	26	26	26	26	26	26
Website Content – Security - H/W	Pearson Correlation	**.182**	**1**	**.031**	**.537(**)**	**.569(**)**	**.445**
	Sig. (2-tailed)	.289		.857	.000	.000	.053
	N	26	26	26	26	26	26
Tech. Support	Pearson Correlation	**.102**	**.031**	**1**	**.153**	**.164**	**.031**
	Sig. (2-tailed)	.555	.857		.373	.338	.858
	N	26	26	26	26	26	26
Website Usability	Pearson Correlation	**.012**	**.537(**)**	**.153**	**1**	**.063**	**.537(**)**
	Sig. (2-tailed)	.946	.000	.373		.717	.000
	N	26	26	26	26	26	26
Website Quality - S/W Security	Pearson Correlation	**.078**	**.569(**)**	**.164**	**.063**	**1**	**.471**
	Sig. (2-tailed)	.651	.000	.338	.717		.051
	N	26	26	26	26	26	26
Website Interactivity – Tech. Support Reliability	Pearson Correlation	**.181**	**.445**	**.031**	**.537(**)**	**.471**	**1**
	Sig. (2-tailed)	.291	.053	.858	.000	.051	
	N	26	26	26	26	26	26

** Correlation is significant at the 0.01 level (2-tailed).

4. People

		HR Training & Development	Skills	Satisfaction - Impact
HR Training & Development	Pearson Correlation	**1**	**.457**	**.118**
	Sig. (2-tailed)		.060	.494
	N	18	18	18
Skills	Pearson Correlation	**.457**	**1**	**.038**
	Sig. (2-tailed)	.060		.827
	N	18	18	18
Satisfaction - Impact	Pearson Correlation	**.118**	**.038**	**1**
	Sig. (2-tailed)	.494	.827	
	N	18	18	18

III. Ministry of Investment (MOI)

1. Strategy

		Strategic Alignment - Stakeholders' Identification – Promotion - Leadership	Challenges - IT Budget Alignment - Leadership (dealing with risks) - Internal Funding	Rsrce Alloc. - External Funding - Stakeholders' Value	Accountability - Policies & Procedures	Action Plan - Goals
Strategic Alignment - Stakeholders' Identification – Promotion - Leadership	Pearson Correlation	**1**	**.629**	**.504**	**.208**	**.148**
	Sig. (2-tailed)		.095	.054	.712	.779
	N	8	8	6	6	6
Challenges - IT Budget Alignment - Leadership (dealing with risks) - Internal Funding	Pearson Correlation	**.629**	**1**	**.451**	**.277**	**.368**
	Sig. (2-tailed)	.095		.085	.595	.473
	N	8	8	6	6	6
Rsrce Alloc. - External Funding - Stakeholders' Value	Pearson Correlation	**.504**	**.451**	**1**	**.397**	**.024**
	Sig. (2-tailed)	.054	.085		.090	.951
	N	6	6	9	9	9
Accountability - Policies & Procedures	Pearson Correlation	**.208**	**.277**	**.397**	**1**	**.012**
	Sig. (2-tailed)	.712	.595	.090		.976
	N	6	6	9	9	9
Action Plan - Goals	Pearson Correlation	**.148**	**.368**	**.024**	**.012**	**1**
	Sig. (2-tailed)	.779	.473	.951	.976	
	N	6	6	9	9	10

2. Processes

		Evaluation of Citizens' Usage, Employees & Citizens' Feedback	Business Process Change (BPC) - Evaluation of E-Government	Business Process Change (BPC) Motives & Areas	Business Processes' Documentation
Evaluation of Citizens' Usage, Employees & Citizens' Feedback	Pearson Correlation	**1**	**.080**	**.088**	**.452**
	Sig. (2-tailed)		.805	.786	.557
	N	12	12	12	12
Business Process Change (BPC) - Evaluation of E-Government	Pearson Correlation	**.080**	**1**	**.109**	**.080**
	Sig. (2-tailed)	.805		.736	.805
	N	12	12	12	12
Business Process Change (BPC) Motives & Areas	Pearson Correlation	**.088**	**.109**	**1**	**.088**
	Sig. (2-tailed)	.786	.736		.786
	N	12	12	12	12
Business Processes' Documentation	Pearson Correlation	**.452**	**.080**	**.088**	**1**
	Sig. (2-tailed)	.557	.805	.786	
	N	12	12	12	12

3. Technology

		Info integration - Website Quality – Tech. Support	Website Services – Security - H/W – Tech. Support Reliability	Info & Sys. Quality	Sys. Integration - Website Transaction - S/W Security	Website Consistency
Info integration - Website Quality – Tech. Support	Pearson Correlation	**1**	**.316**	**.023**	**.357(**)**	**.151**
	Sig. (2-tailed)		.446	.957	.007	.849
	N	8	8	8	8	4
Website Services – Security - H/W – Tech. Support Reliability	Pearson Correlation	**.316**	**1**	**.267**	**.151**	**.601**
	Sig. (2-tailed)	.446		.522	.721	.399
	N	8	8	8	8	4
Info & Sys. Quality	Pearson Correlation	**.023**	**.267**	**1**	**.156**	**.042**
	Sig. (2-tailed)	.957	.522		.711	.958
	N	8	8	8	8	4
Sys. Integration - Website Transaction - S/W Security	Pearson Correlation	**.357(**)**	**.151**	**.156**	**1**	**.478**
	Sig. (2-tailed)	.007	.721	.711		.522
	N	8	8	8	8	4
Website Consistency	Pearson Correlation	**.151**	**.601**	**.042**	**.478**	**1**
	Sig. (2-tailed)	.849	.399	.958	.522	
	N	4	4	4	4	8

** Correlation is significant at the 0.01 level (2-tailed).

4. People

		HR Training & Development 1	Satisfaction – Impact - Skills	HR Training & Development 2
HR Training & Development 1	Pearson Correlation	**1**	**.113**	**.009**
	Sig. (2-tailed)		.655	.973
	N	18	18	18
Satisfaction – Impact - Skills	Pearson Correlation	**.113**	**1**	**.141**
	Sig. (2-tailed)	.655		.576
	N	18	18	18
HR Training & Development 2	Pearson Correlation	**.009**	**.141**	**1**
	Sig. (2-tailed)	.973	.576	
	N	18	18	18

IV. Public Hospital (PH)

1. Strategy

		Motives - Strategic Alignment – Structure – Funding - Leadership	Challenges – Value on Stakeholders	IT strategy - Goals	Role of Stakeholders	Stakeholders' Identification
Motives - Strategic Alignment – Structure – Funding - Leadership	Pearson Correlation	**1**	**.235**	**.051**	**.141**	**.014**
	Sig. (2-tailed)		.462	.874	.661	.965
	N	12	19	12	17	12
Challenges – Value on Stakeholders	Pearson Correlation	**.235**	**1**	**.000**	**.000**	**.000**
	Sig. (2-tailed)	.462		1.000	1.000	1.000
	N	19	12	17	12	13
IT strategy - Goals	Pearson Correlation	**.050(*)**	**.000**	**1**	**.000**	**.000**
	Sig. (2-tailed)	.874	1.000		1.000	1.000
	N	12	17	12	13	15
Role of Stakeholders	Pearson Correlation	**.141**	**.000**	**.000**	**1**	**.000**
	Sig. (2-tailed)	.661	1.000	1.000		1.000
	N	17	12	13	15	17
Stakeholders' Identification	Pearson Correlation	**.014**	**.000**	**.000**	**.000**	**1**
	Sig. (2-tailed)	.965	1.000	1.000	1.000	
	N	12	13	15	17	13

* Correlation is significant at the 0.05 level (2-tailed).

2. Processes

		Business Process Change (BPC)	Evaluation of employees' Use & Impact on Stakeholders	Evaluation of E-Government
Business Process Change (BPC)	Pearson Correlation	**1**	**.224**	**.068**
	Sig. (2-tailed)		.720	.879
	N	41	35	35
Evaluation of employees' Use & Impact on Stakeholders	Pearson Correlation	**.224**	**1**	**.000**
	Sig. (2-tailed)	.720		1.000
	N	35	35	5
Evaluation of E-Government	Pearson Correlation	**.068**	**.000**	**1**
	Sig. (2-tailed)	.879	1.000	
	N	35	35	35

3. Technology

		Security - H/W – Tech. Support	Info Convenience - Sys. Quality – Tech. Support Communication	Info Timeliness & Internet Integration - Sys. Reliability	Sys. Usability, Accessibility, & Flexibility	Info Availability, Accuracy, & Vert. Integration	Info Horiz. Integration
Security - H/W – Tech. Support	Pearson Correlation	**1**	**.128**	**.197**	**.055**	**.121**	**.034**
	Sig. (2-tailed)		.763	.640	.898	.775	.936
	N	8	8	8	8	8	8
Info Convenience - Sys. Quality – Tech. Support Communication	Pearson Correlation	**.128**	**1**	**.475**	**.131**	**.292**	**.082**
	Sig. (2-tailed)	.763		.235	.756	.483	.847
	N	8	8	8	8	8	8
Info Timeliness & Internet Integration - Sys. Reliability	Pearson Correlation	**.197**	**.475**	**1**	**.203**	**.450**	**.127**
	Sig. (2-tailed)	.640	.235		.630	.263	.765
	N	8	8	8	8	8	8
Sys. Usability, Accessibility, & Flexibility	Pearson Correlation	**.055**	**.131**	**.203**	**1**	**.125**	**.035**
	Sig. (2-tailed)	.898	.756	.630		.768	.934
	N	8	8	8	8	8	8
Info Availability, Accuracy, & Vert. Integration	Pearson Correlation	**.121**	**.292**	**.450**	**.125**	**1**	**.078**
	Sig. (2-tailed)	.775	.483	.263	.768		.855
	N	8	8	8	8	8	8
Info Horiz. Integration	Pearson Correlation	**.034**	**.082**	**.127**	**.035**	**.078**	**1**
	Sig. (2-tailed)	.936	.847	.765	.934	.855	
	N	8	8	8	8	8	8

4. People

		HR Training & Development 1	Impact – CS Skills – Satisfaction - HR Training & Development 2	Change Skills
HR Training & Development 1	Pearson Correlation	**1**	**.375**	**.115**
	Sig. (2-tailed)		.628	.868
	N	17	17	17
Impact – CS Skills – Satisfaction - HR Training & Development 2	Pearson Correlation	**.375**	**1**	**.497(*)**
	Sig. (2-tailed)	.628		.045
	N	17	17	17
Change Skills	Pearson Correlation	**.115**	**.497(*)**	**1**
	Sig. (2-tailed)	.868	.045	
	N	17	17	17

* Correlation is significant at the 0.05 level (2-tailed).

Appendix F: Reliability

I. Montaza District (MD)

Dimensions	Cronbach's Alpha	Constructs	Cronbach's Alpha
Strategy	0.9658	Leadership -Stakeholders - Promotion	0.9733
		Funding - Stakeholders' Identification	0.9899
		Objectives - Accountability	0.9112
		Strategic Alignment	0.9777
		IT Strategy	0.9556
Processes	0.9649	Evaluation of Citizens feedback	0.9334
		Evaluation of employees feedback	0.9800
		Business Process Change (BPC)	0.9865
Technology	0.9887	Web Quality	0.9986
		Info Quality - Sys. Integration	0.9856
		Tech Support	0.9905
		Sys. Quality	0.9136
		Security	0.8993
People	0.8976	HR Training & Development	0.9378
		Impact - Customer Service Skills	0.9865
		Skills	0.9342
EGR	0.9785	EGR	0.9785

II. Tax Unit for Non-Commercial professions (TUNC)

Dimensions	Cronbach's Alpha	Constructs	Cronbach's Alpha
Strategy	0.8996	Action Plan – Goals - Challenges - Stakeholders	0.8994
		Rsrce Alloc. – Accountability – Structure - Policies & Procedures	0.8923
		Motives - IT Budget Alignment	0.9112
		Stakeholders' Identification	0.9003
		Strategy & Action Plan Alignment - Leadership	0.8896
Processes	0.9023	Evaluation of Feedback & Impact of Stakeholders	0.9225
		Business Process Change (BPC) Definition & Integration	0.9100
		Evaluation of E-Government & Use of Employees	0.8867
Technology	0.8867	Inf. & Sys. Quality	0.8990
		Website Content – Security - H/W	0.8996
		Tech. Support	0.8990
		Website Usability	0.9023
		Website Quality - S/W Security	0.9134
		Website Interactivity – Tech. Support Reliability	0.9008
People	0.8962	HR Training & Development	0.9111
		Skills	0.8475
		Satisfaction - Impact	0.8663
EGR	0.9001	EGR	0.9128

III. Ministry of Investment (MOI)

Dimensions	Cronbach's Alpha	Constructs	Cronbach's Alpha
Strategy	0.9275	Strategic Alignment - Stakeholders' Identification – Promotion - Leadership	0.9668
		Challenges - IT Budget Alignment - Leadership (dealing with risks) - Internal Funding	0.9121
		Rsrce Alloc. - External Funding - Stakeholders' Value	0.9047
		Accountability - Policies & Procedures	0.9256
		Action Plan - Goals	0.9111
Processes	0.9359	Evaluation of Citizens' Usage, Employees & Citizens' Feedback	0.9008
		Business Process Change (BPC) - Evaluation of E-Government	0.9076
		Business Process Change (BPC) Motives & Areas	0.9336
		Business Processes' Documentation	0.9591
Technology	0.9447	Info integration - Website Quality – Tech. Support	0.9867
		Website Services – Security - H/W – Tech. Support Reliability	0.9774
		Info & Sys. Quality	0.9539
		Sys. Integration - Website Transaction - S/W Security	0.9300
		Website Consistency	0.9323
People	0.9789	HR Training & Development 1	0.9582
		Satisfaction – Impact - Skills	0.9833
		HR Training & Development 2	0.9890
EGR	0.9773	EGR	0.9842

IV. Public Hospital (PH)

Dimensions	Cronbach's Alpha	Constructs	Cronbach's Alpha
Strategy	0.9032	Motives - Strategic Alignment – Structure – Funding - Leadership	0.9173
		Challenges – Value on Stakeholders	0.8983
		IT strategy - Goals	0.9193
		Role of Stakeholders	0.9643
		Stakeholders' Identification	0.9789
Processes	0.9269	Business Process Change (BPC)	0.9045
		Evaluation of employees' Use & Impact on Stakeholders	0.9532
		Evaluation of E-Government	0.9226
Technology	0.8132	Security - H/W – Tech. Support	0.8563
		Info Convenience - Sys. Quality – Tech. Support Communication	0.8220
		Info Timeliness & Internet Integration - Sys. Reliability	0.9136
		Sys. Usability, Accessibility, & Flexibility	0.8987
		Info Availability, Accuracy, & Vert. Integration	0.8118
		Info Horiz. Integration	0.8358
People	0.9141	HR Training & Development 1	0.9087
		Impact – CS Skills – Satisfaction - HR Training & Development 2	0.9073
		Change Skills	0.8997
EGR	0.9512	EGR	0.9437

Appendix G: Validity

I. Montaza District (MD)

Construct	Dimension	Correlations range	Significant level
Strategy	Leadership -Stakeholders - Promotion	(0.578, 0.886)	0.01 (2-tailed)
	Funding - Stakeholders' Identification	(0.656, 0.906)	0.01 (2-tailed)
	Objectives - Accountability	(0.745, 0.996)	0.01 (2-tailed)
	Strategic Alignment	(0.568, 0.784)	0.01 (2-tailed)
	IT Strategy	(0.731, 0.915)	0.05 (2-tailed)
Processes	Evaluation of Citizens feedback	(0.664, 0.894)	0.01 (2-tailed)
	Evaluation of employees feedback	(0.568, 0.919)	0.01 (2-tailed)
	Business Process Change (BPC)	(0.710, 0.899)	0.01 (2-tailed)
Technology	Web Quality	(0.711, 0.857)	0.01 (2-tailed)
	Info Quality - Sys. Integration	(0.597, 0.923)	0.01 (2-tailed)
	Tech Support	(0.665, 0.978)	0.05 (2-tailed)
	Sys. Quality	(0.776, 0.853)	0.05 (2-tailed)
	Security	(0.634, 0.952)	0.01 (2-tailed)
People	HR Training & Development	(0.701, 0.875)	0.01 (2-tailed)
	Impact - Customer Service Skills	(0.832, 0.975)	0.05 (2-tailed)
	Skills	(0.774, 0.933)	0.01 (2-tailed)

II. Tax Unit for Non-Commercial Professions (TUNC)

Construct	Dimension	Correlations range	Significant level
Strategy	Evaluation of Citizens feedback	(0.742, 0.965)	0.05 (2-tailed)
	Evaluation of employees feedback	(0.674, 0.885)	0.01 (2-tailed)
	Business Process Change (BPC)	(0.602, 0.953)	0.01 (2-tailed)
	Web Quality	(0.721, 0.934)	0.01 (2-tailed)
	Info Quality - Sys. Integration	(0.711, 0.967)	0.01 (2-tailed)
Processes	Tech Support	(0.711, 0.937)	0.05 (2-tailed)
	Sys. Quality	(0.673, 0.958)	0.05 (2-tailed)
	Security	(0.690, 0.922)	0.05 (2-tailed)
Technology	HR Training & Development	(0.611, 0.867)	0.05 (2-tailed)
	Impact - Customer Service Skills	(0.599, 0.927)	0.05 (2-tailed)
	Skills	(0.714, 0.974)	0.01 (2-tailed)
	Evaluation of Citizens feedback	(0.700, 0.909)	0.05 (2-tailed)
	Evaluation of employees feedback	(0.657, 0.910)	0.05 (2-tailed)
	Business Process Change (BPC)	(0.599, 0.874)	0.05 (2-tailed)
People	Web Quality	(0.691, 0.922)	0.01 (2-tailed)
	Info Quality - Sys. Integration	(0.710, 0.994)	0.01 (2-tailed)
	Tech Support	(0.774, 0.981)	0.05 (2-tailed)

III. Ministry of Investment (MOI)

Construct	Dimension	Correlations range	Significant level
Strategy	Strategic Alignment - Stakeholders' Identification – Promotion - Leadership	(0.654, 0.901)	0.05 (2-tailed)
	Challenges - IT Budget Alignment - Leadership (dealing with risks) - Internal Funding	(0.788, 0.987)	0.01 (2-tailed)
	Rsrce Alloc. - External Funding - Stakeholders' Value	(0.729, 0.970)	0.05 (2-tailed)
	Accountability - Policies & Procedures	(0.721, 0.988)	0.01 (2-tailed)
	Action Plan - Goals	(0.722, 0.946)	0.01 (2-tailed)
Processes	Evaluation of Citizens' Usage, Employees & Citizens' Feedback	(0.621, 0.886)	0.05 (2-tailed)
	Business Process Change (BPC) - Evaluation of E-Government	(0.702, 0.956)	0.05 (2-tailed)
	Business Process Change (BPC) Motives & Areas	(0.775, 0.943)	0.05 (2-tailed)
	Business Processes' Documentation	(0.722, 0.923)	0.05 (2-tailed)
Technology	Info integration - Website Quality – Tech. Support	(0.745, 0965)	0.01 (2-tailed)
	Website Services – Security - H/W – Tech. Support Reliability	(0.698, 0.900)	0.05 (2-tailed)
	Info & Sys. Quality	(0.746, 0.939)	0.05 (2-tailed)
	Sys. Integration - Website Transaction - S/W Security	(0.722, 0.924)	0.05 (2-tailed)
	Website Consistency	(0.708, 0.914)	0.05 (2-tailed)
People	HR Training & Development 1	(0.712, 0.995)	0.01 (2-tailed)
	Satisfaction – Impact - Skills	(0.742, 0.978)	0.01 (2-tailed)

	HR Training & Development 2	(0.713, 0.950)	0.05 (2-tailed)

IV. Public Hospital (PH)

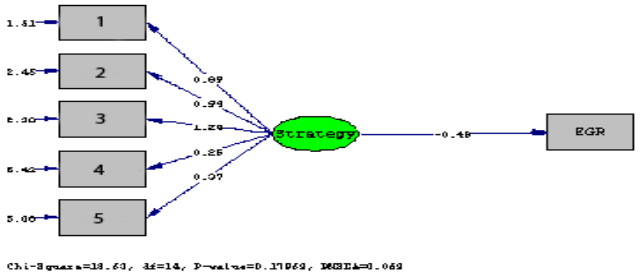
Construct	Dimension	Correlations range	Significant level
Strategy	Motives - Strategic Alignment – Structure – Funding - Leadership	(0.592, 0.883)	0.05 (2-tailed)
	Challenges – Value on Stakeholders	(0.551, 0.795)	0.05 (2-tailed)
	IT strategy - Goals	(0.610, 0.921)	0.01 (2-tailed)
	Role of Stakeholders	(0.683, 0.904)	0.05 (2-tailed)
	Stakeholders' Identification	(0.712, 0.954)	0.01 (2-tailed)
Processes	Business Process Change (BPC)	(0.627, 0.889)	0.05 (2-tailed)
	Evaluation of employees' Use & Impact on Stakeholders	(0.545, 0.899)	0.05 (2-tailed)
	Evaluation of E-Government	(0.637, 0.916)	0.05 (2-tailed)
Technology	Security - H/W – Tech. Support	(0.644, 0.890)	0.05 (2-tailed)
	Info Convenience - Sys. Quality – Tech. Support Communication	(0.525, 0.800)	0.05 (2-tailed)
	Info Timeliness & Internet Integration - Sys. Reliability	(0.531, 0.822)	0.05 (2-tailed)
	Sys. Usability, Accessibility, & Flexibility	(0.616, 0.899)	0.05 (2-tailed)
	Info Availability, Accuracy, & Vert. Integration	(0.543, 0.875)	0.05 (2-tailed)
	Info Horiz. Integration	(0.655, 0.870)	0.05 (2-tailed)
People	HR Training & Development 1	(0.745, 0.987)	0.05 (2-tailed)
	Impact – CS Skills – Satisfaction - HR Training & Development 2	(0.701, 0.979)	0.01 (2-tailed)
	Change Skills	(0.726, 0.978)	0.05 (2-tailed)

Appendix H: Partial Models (LISREL Version 8.72)

I. Montaza District (MD)

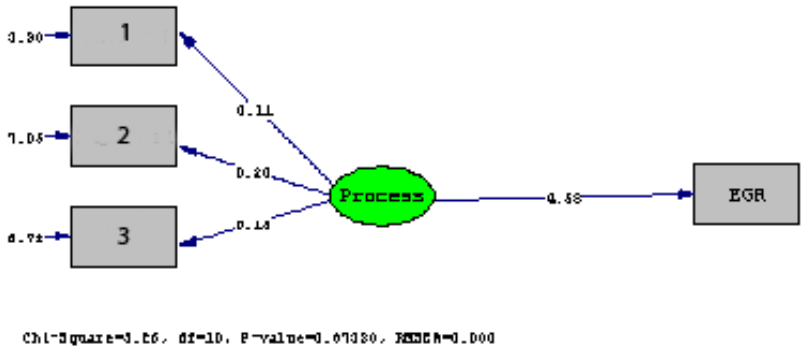
Hypothesis 1 (H1): E-government strategy impacts EGR of the organisation

Using EGR as the dependent construct and Strategy as the independent construct in the partial model, the results display a modest fit to data (x^2 = 18.53, df = 14, *P*-value = 0.17969) as shown in the figure.Therefore, Strategy has an impact on EGR in the partial model.



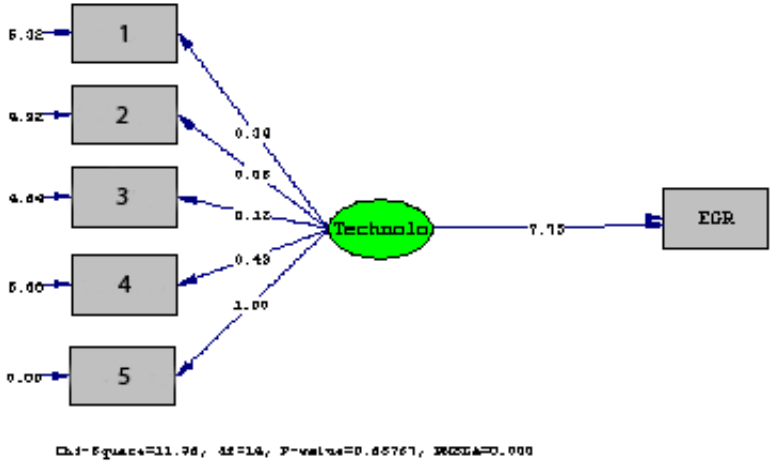
Hypothesis 2 (H2): Organisation's processes impacts its EGR

Using EGR as the dependent construct and Process as the independent construct in the partial model, the results display a high fit to data (x^2 = 5.26, df = 10, *P*-value = 0.87330) as shown in the figure. Therefore, Processes have an impact on EGR in the partial model.



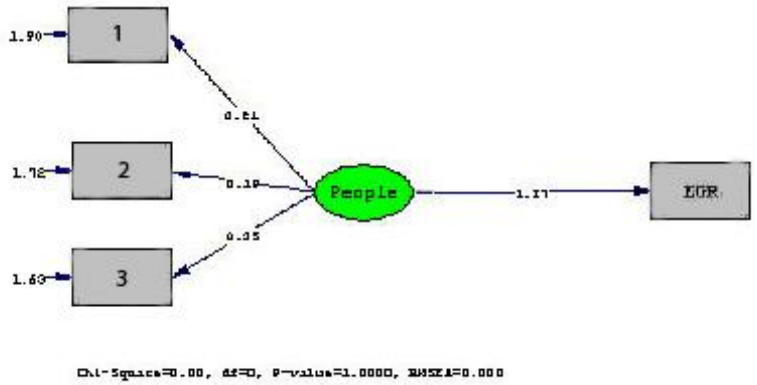
Hypothesis 3 (H3): Technology in the organisation impacts its EGR

Using EGR as the dependent construct and Technology as the independent construct in the partial model, the results display a high fit to data (x^2 = 11.36, df = 14, *P*-value = 0.65767) as shown in the figure. Therefore, Technology has an impact on EGR in the partial model.



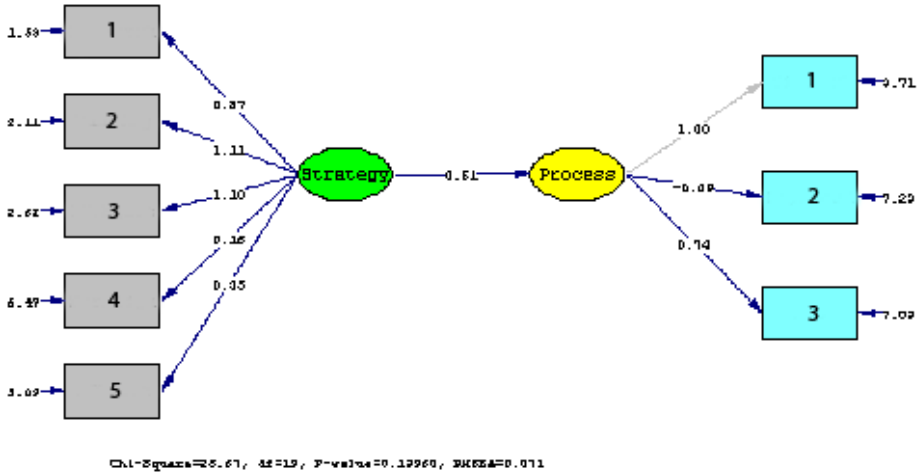
Hypothesis 4 (H4): People in the organisation impacts its EGR

Using EGR as the dependent construct and People as the independent construct in the partial model, the results display a perfect fit to data (x^2 0.00, df = 0, *P*-value = 1.00000) as shown in the figure. Therefore, people have high impact on EGR in the partial model.



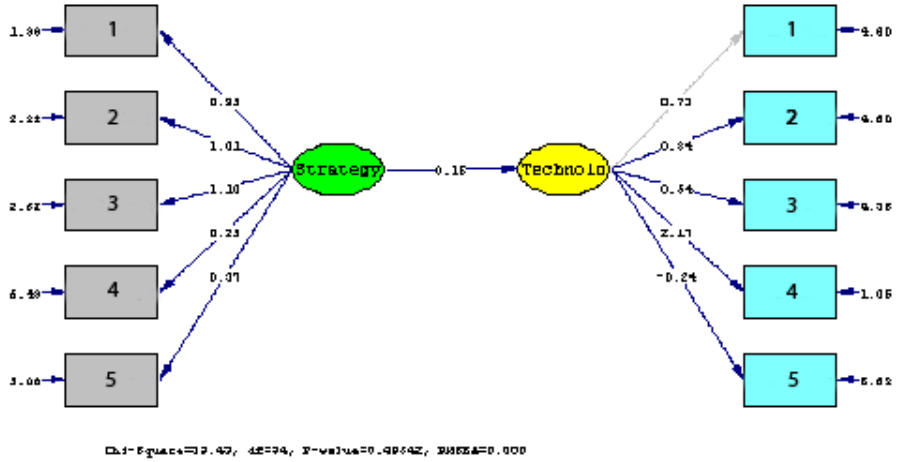
Hypothesis 5a (H5a): E-government strategy impacts processes in the organisation

Using Process as the dependent construct and Strategy as the independent construct in the partial model, the results display a weak fit to data (x^2 = 25.67, df = 19, *P*-value = 0.13960) as shown in the figure. Therefore, Strategy has weak impact on Processes in the partial model.



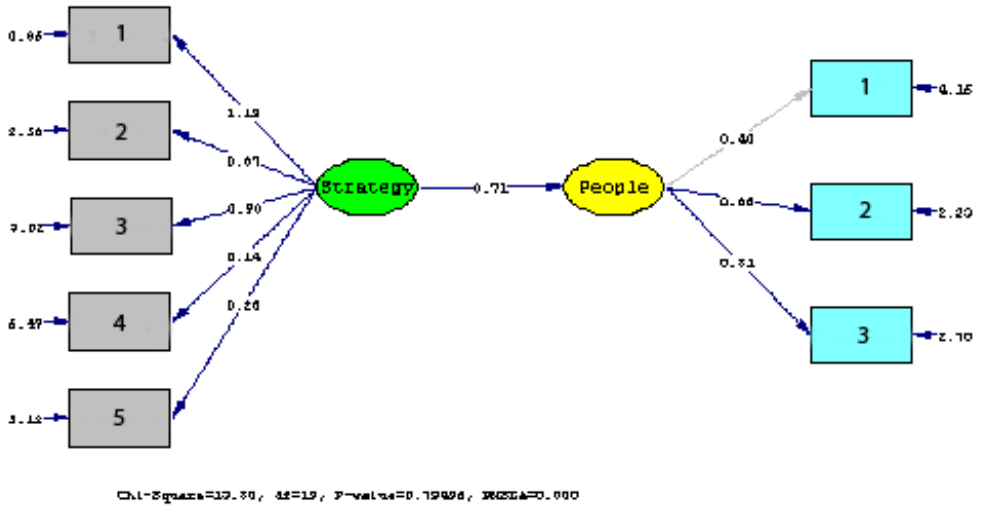
Hypothesis 5b (H5b): E-government strategy impacts technology in the organisation

Using Technology as the dependent construct and Strategy as the independent construct in the partial model, the results display a modest fit to data (x^2 = 33.43, df = 43, *P*-value = 0.49542) as shown in the figure. Therefore, Strategy has modest impact on Technology in the partial model.



Hypothesis 5c (H5c): E-government strategy impacts people in the organisation

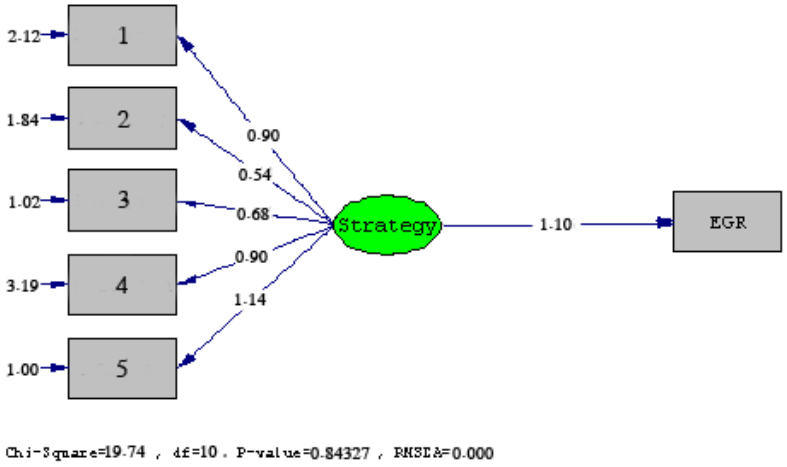
Using People as the dependent construct and Strategy as the independent construct in the partial model, the results display a high fit to data (x^2 = 13.8, df = 19, *P*-value = 0.79496) as shown in the figure.Therefore, Strategy has high impact on People in the partial model.



II. Tax Unit for Non-Commercial Professions (TUNC)

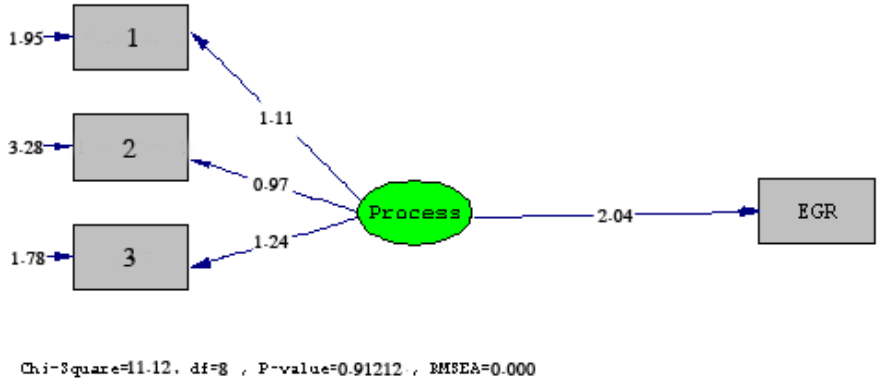
Hypothesis 1 (H1): E-government strategy impacts EGR in the organisation

Using EGR as the dependent construct and Strategy as the independent construct in the partial model, the results display a high fit to data (x^2 = 19.74, df = 10, *P*-value = 0.84327) as shown in the figure.



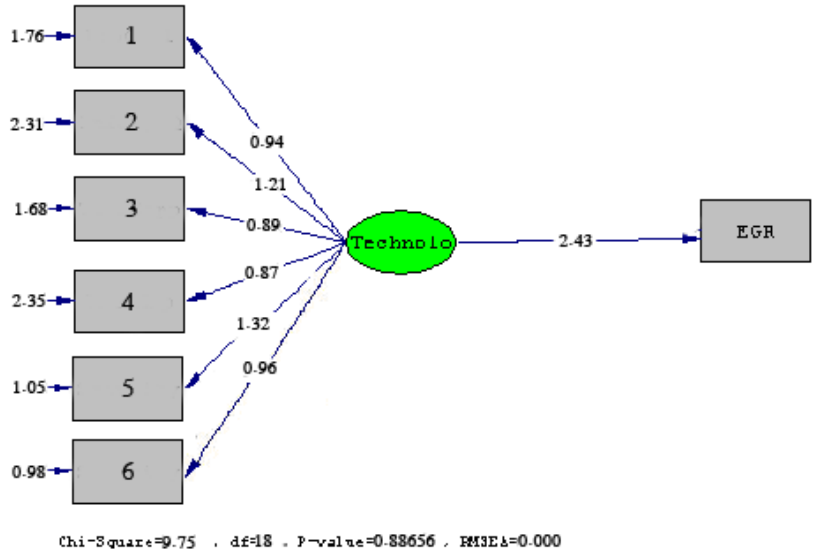
Hypothesis 2 (H2): Organisation's processes impacts its EGR

Using EGR as the dependent construct and Process as the independent construct in the partial model, the results display a high fit to data (x^2 = 11.12, df = 8, *P*-value = 0.91212) as shown in the figure.



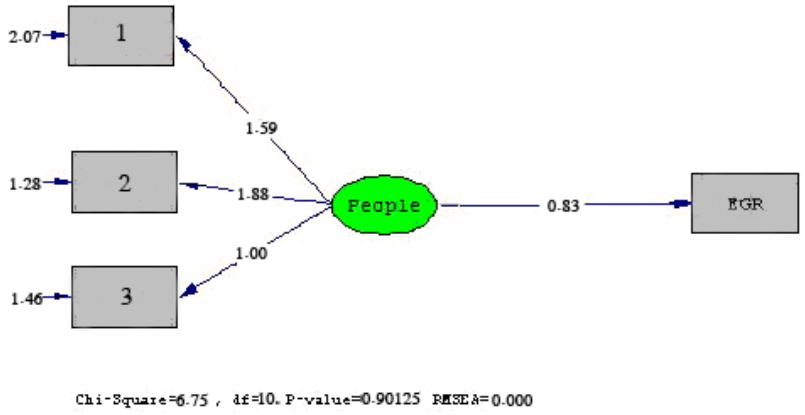
Hypothesis 3 (H3): Technology in the organisation impacts its EGR

Using EGR as the dependent construct and Technology as the independent construct in the partial model, the results display a high fit to data (x^2 = 9.75, df = 18, *P*-value = 0.88656) as shown in the figure.



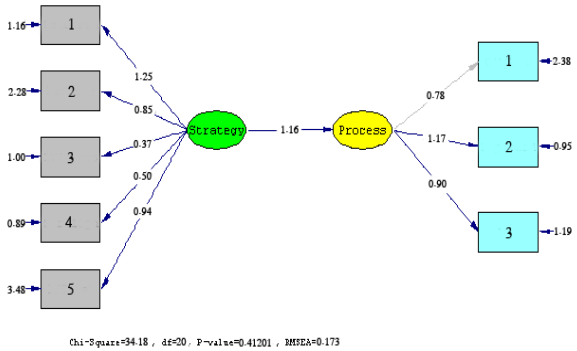
Hypothesis 4 (H4): People in the organisation impacts its EGR

Using EGR as the dependent construct and People as the independent construct in the partial model, the results display a high fit to data (x^2 6.75, df = 10, *P*-value = 0.90125) as shown in the figure.



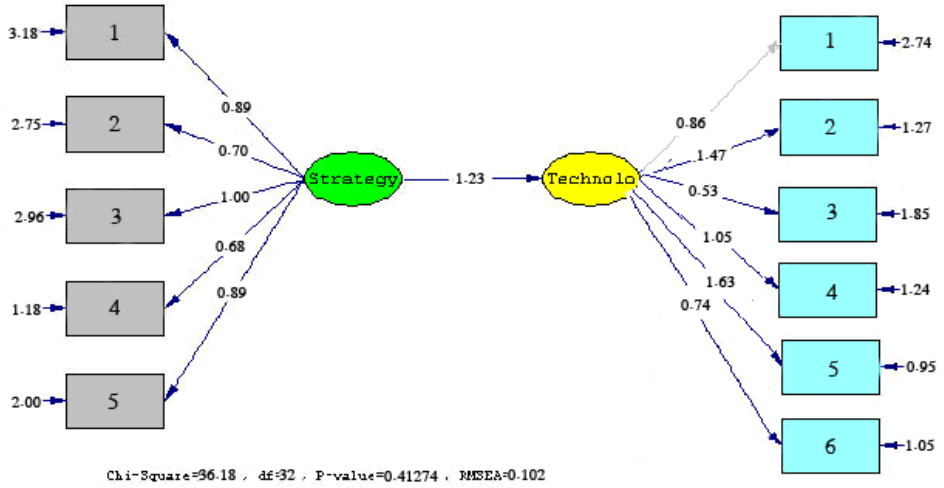
Hypothesis 5a (H5a): E-government strategy impacts processes in the organisation

Using Process as the dependent construct and Strategy as the independent construct in the partial model, the results display a modest fit to data (x^2 = 34.18, df = 20, *P*-value = 0.41201) as shown in the figure.



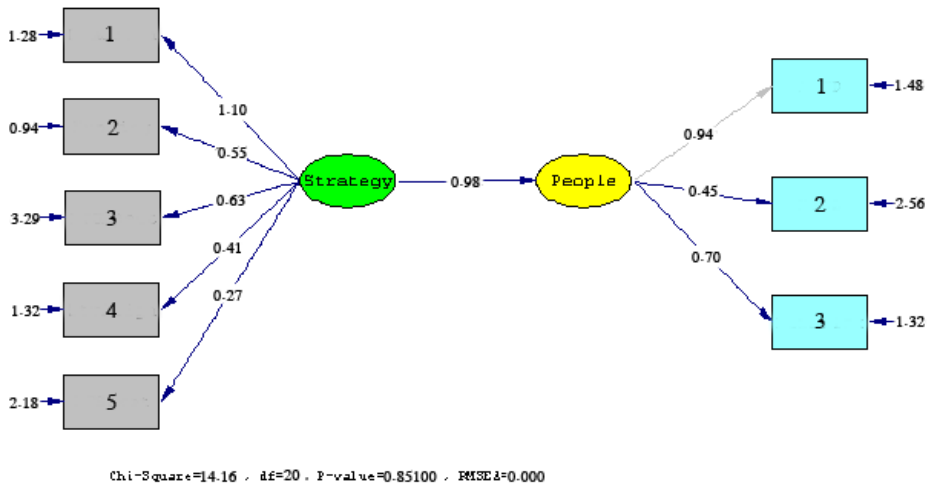
Hypothesis 5b (H5b): E-government strategy impacts technology in the organisation

Using Technology as the dependent construct and Strategy as the independent construct in the partial model, the results display a modest fit to data (x^2 = 36.18, df = 32, *P*-value = 0.41274) as shown in the figure.



Hypothesis 5c (H5c): E-government strategy impacts people in the organisation

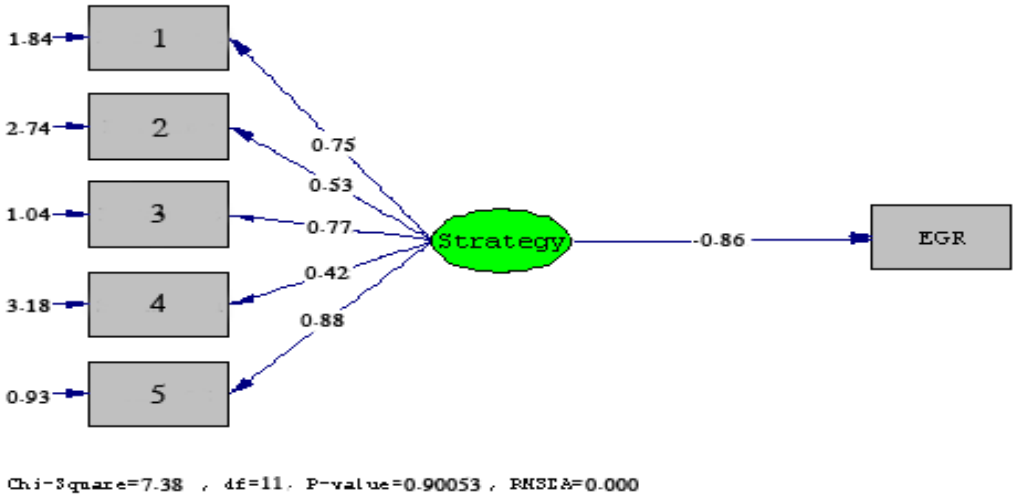
Using People as the dependent construct and Strategy as the independent construct in the partial model, the results display a high fit to data (x^2 = 14.16, df = 20, *P*-value = 0.85100) as shown in the figure.



III. Ministry of Investment (MOI)

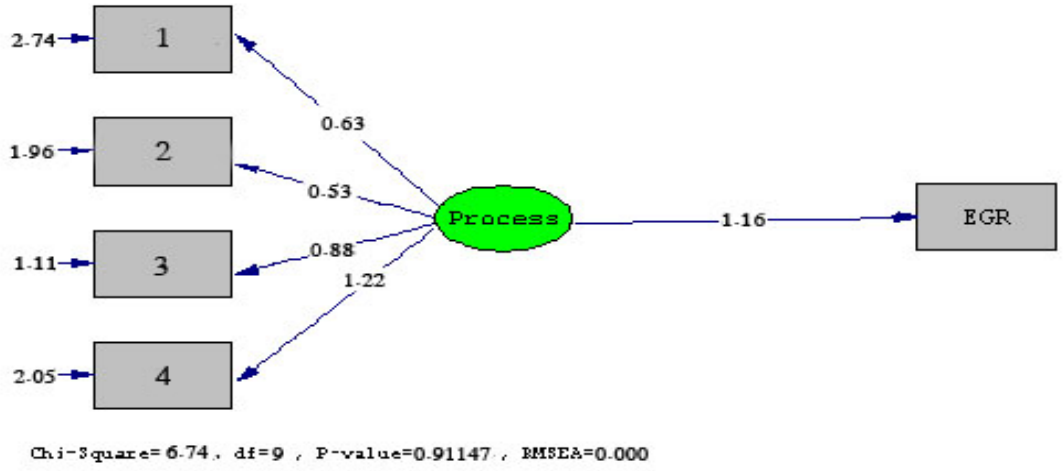
Hypothesis 1 (H1): E-government strategy impacts EGR in the organisation

Using EGR as the dependent construct and Strategy as the independent construct in the partial model, the results display a high fit to data (x^2 = 7.38, df = 11, *P*-value = 0.90053).



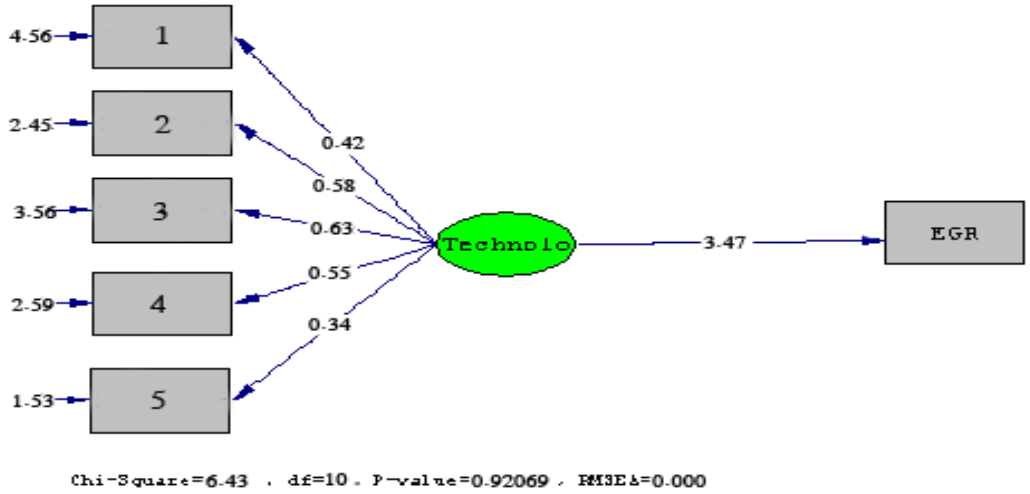
Hypothesis 2 (H2): Organisation's processes impacts its EGR

Using EGR as the dependent construct and Process as the independent construct in the partial model, the results display a high fit to data (x^2 = 6.74, df = 9, *P*-value = 0.91147)



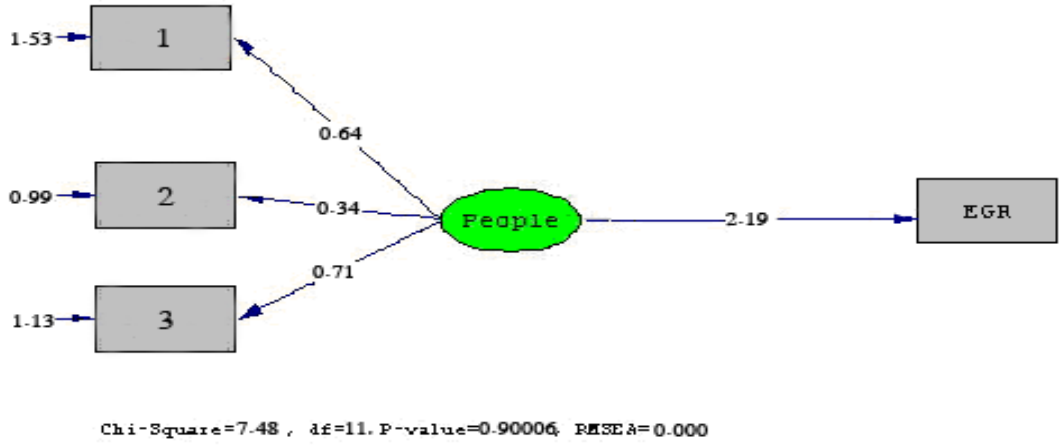
Hypothesis 3 (H3): Technology in the organisation impacts its EGR

Using EGR as the dependent construct and Technology as the independent construct in the partial model, the results display a high fit to data (x^2 = 6.43, df = 10, *P*-value = 0.92069).



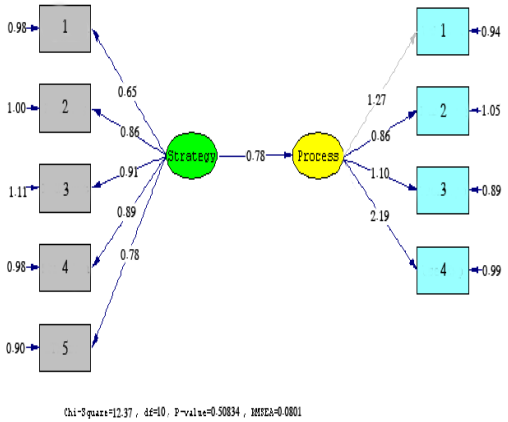
Hypothesis 4 (H4): People in the organisation impacts its EGR

Using EGR as the dependent construct and People as the independent construct in the partial model, the results display a high fit to data (x^2 = 7.48, df = 11, *P*-value = 0.90006).



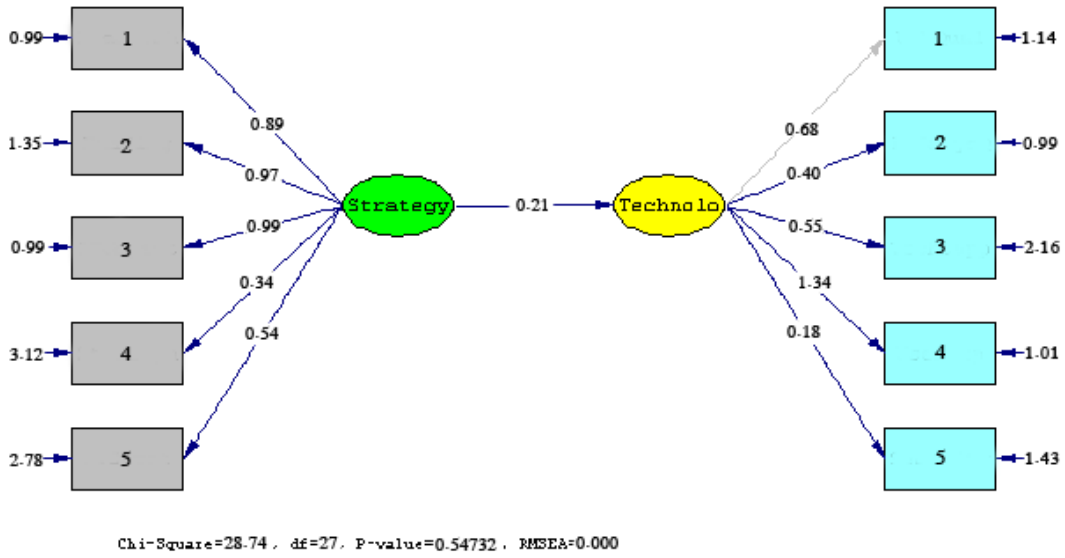
Hypothesis 5a (H5a): E-government strategy impacts processes in the organisation

Using Process as the dependent construct and Strategy as the independent construct in the partial model, the results display a good fit to data (x^2 = 12.37, df = 10, *P*-value = 0.50834).



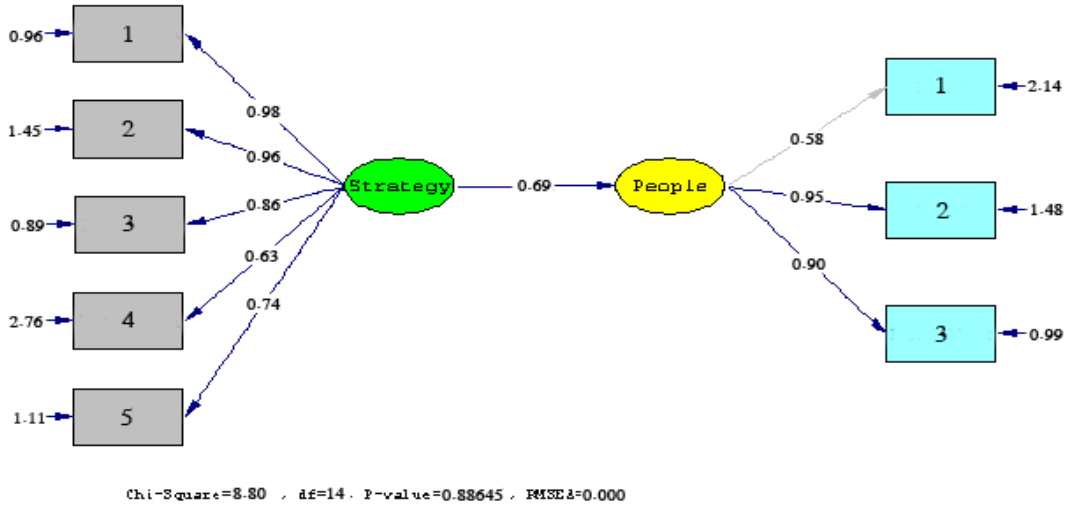
Hypothesis 5b (H5b): E-government strategy impacts technology in the organisation

Using Technology as the dependent construct and Strategy as the independent construct in the partial model, the results display a good fit to data (x^2 = 28.74, df = 27, *P*-value = 0.54732).



Hypothesis 5c (H5c): E-government strategy impacts people in the organisation

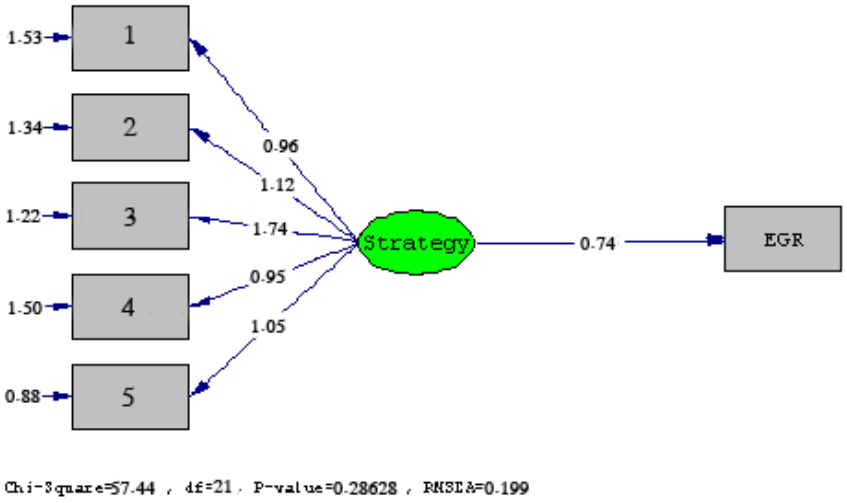
Using People as the dependent construct and Strategy as the independent construct in the partial model, the results display a high fit to data (x^2 = 8.80, df = 14, *P*-value = 0.88645).



IV. Public Hospital (PH)

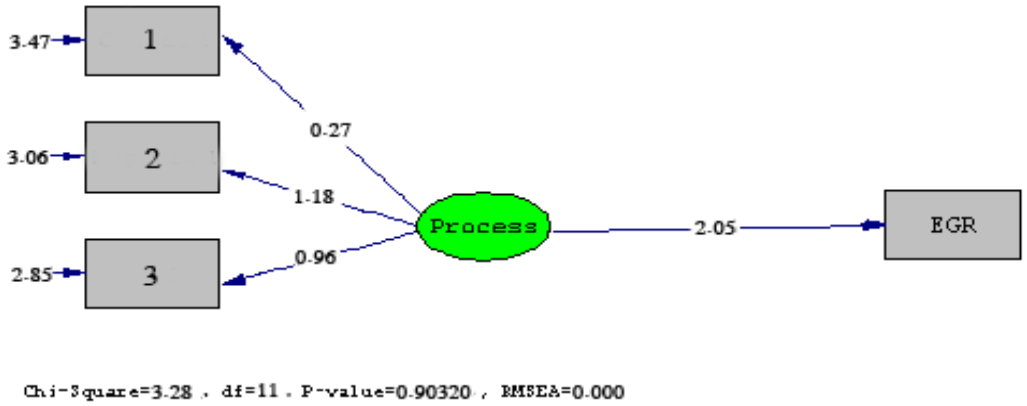
Hypothesis 1 (H1): E-government strategy impacts EGR in the organisation

Using EGR as the dependent construct and Strategy as the independent construct in the partial model, the results display a weak fit to data (x^2 = 57.44, df = 21, *P*-value = 0.28628).



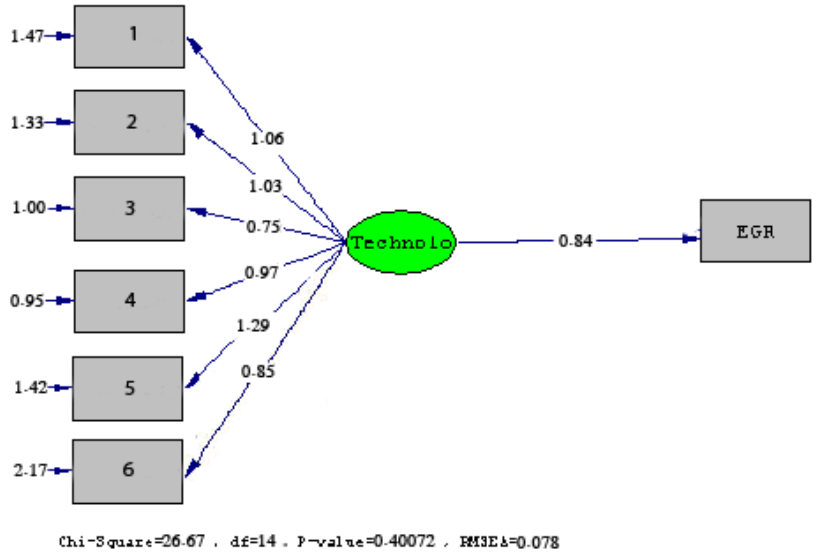
Hypothesis 2 (H2): Organisation's processes impacts its EGR

Using EGR as the dependent construct and Process as the independent construct in the partial model, the results display a high fit to data (x^2 = 3.28, df = 11, *P*-value = 0.90320)



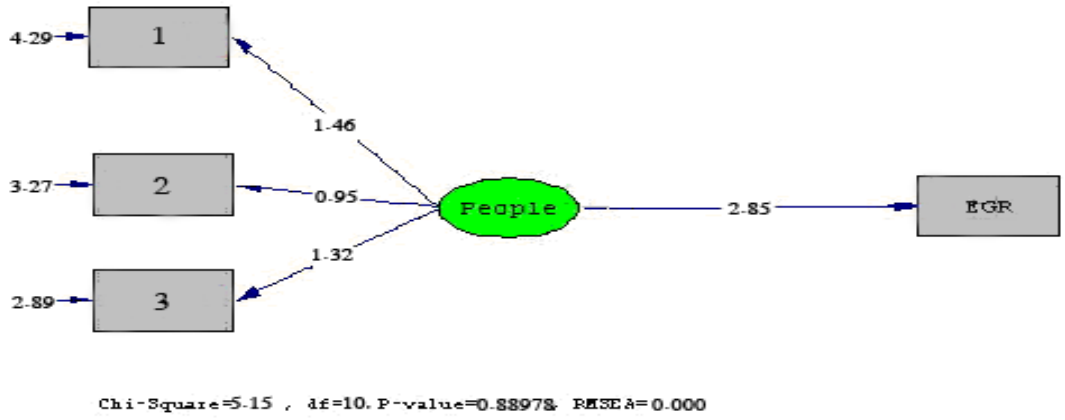
Hypothesis 3 (H3): Technology in the organisation impacts its EGR

Using EGR as the dependent construct and Technology as the independent construct in the partial model, the results display a modest fit to data (x^2 = 26.67, df = 14, *P*-value = 0.40072).



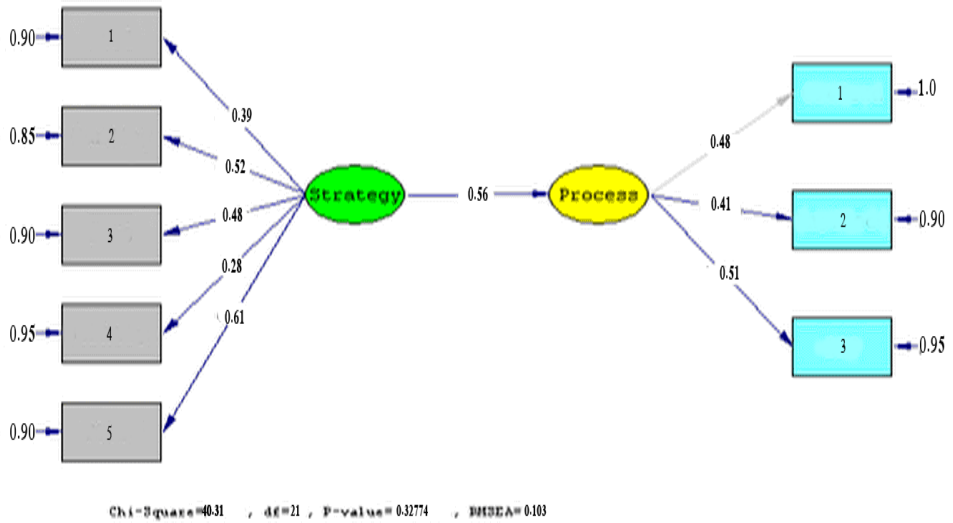
Hypothesis 4 (H4): People in the organisation impacts its EGR

Using EGR as the dependent construct and People as the independent construct in the partial model, the results display a high fit to data (x^2 = 5.15, df = 10, *P*-value = 0.88978).



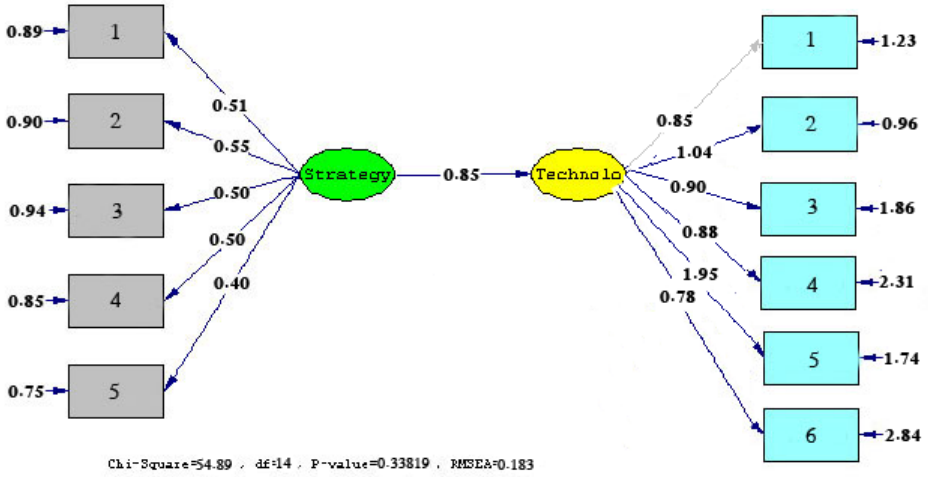
Hypothesis 5a (H5a): E-government strategy impacts processes in the organisation

Using Process as the dependent construct and Strategy as the independent construct in the partial model, the results display a modest fit to data (x^2 = 40.31, df = 21, *P*-value = 0.32774).



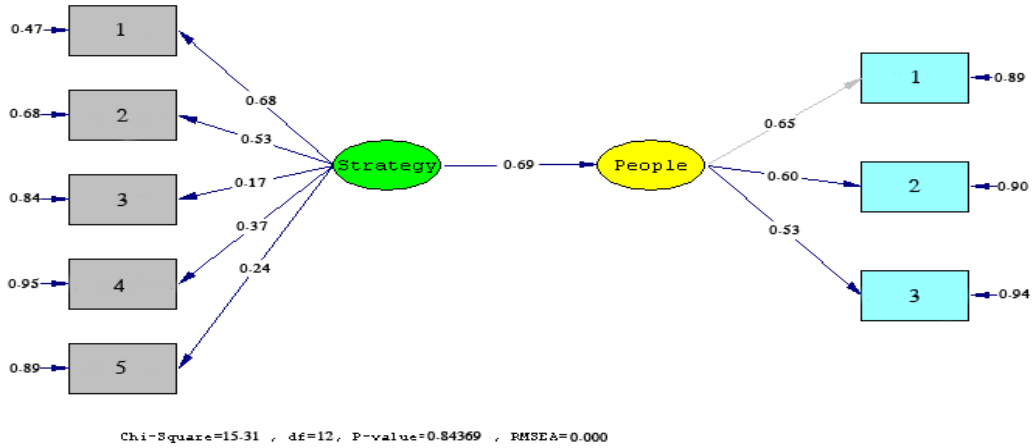
Hypothesis 5b (H5b): E-government strategy impacts technology in the organisation

Using Technology as the dependent construct and Strategy as the independent construct in the partial model, the results display a weak fit to data (x^2 = 54.89, df = 14, *P*-value = 0.33819).



Hypothesis 5c (H5c): E-government strategy impacts people in the organisation

Using People as the dependent construct and Strategy as the independent construct in the partial model, the results display a high fit to data (x^2 = 15.31, df = 12, *P*-value = 0.84369).



Appendix I: Combined Data of Egypt

I. Factor Analysis

1. Strategy

Initial factor analysis

	Component					
	Strategic Alignment 1 – Promotion - Leadership	Action Plan - Goals 2 - Challenges - Stakeholders	Goals 1 – Motives - External Funding	Strategic Alignment 3 – Leadership	Accountability – Structure - Policies & Procedures	IT Strategy – Resource Allocation
IT Strategy	.471	.333	.160	-.124	.081	**.704**
Strategy:Goals 1	.374	.332	**.560**	.019	.218	.249
Strategy: Action Plan	.107	**.915**	-.006	-.174	.107	.254
Strategy:Goals 2	.338	**.570**	.127	-.578	.148	.205
Strategy: Motives	.015	.287	**.810**	.326	.004	.126
Strategy: Challenges	.068	**.859**	.222	.406	.043	.149
Strategy: Strtgic Align 1	**.514**	.401	.312	.472	.367	-.221
Strategy: Strtgic Align 2	.526	.262	.241	.657	.337	.063
Strategy: Strtgic Align 3	.392	.027	.298	**.811**	.193	-.023
Strategy: Action Plan – Org. - Rsrce alloc	.225	-.084	.094	.172	.285	**.868**
Strategy: Action Plan – Org. - Accountability	.349	.103	.077	.120	**.917**	.029
Strategy: Action Plan – Org. - Structure	.415	.124	.017	.113	**.735**	.452
Strategy: Action Plan – Org. – Est. & imp of policies & procedures	.051	.347	.406	.206	**.752**	.303
Strategy: Action Plan – Org. – Leadership	.038	.103	.422	**.768**	.142	.389

Strategy: Action Plan – Funding -- Internal	.525	.127	.695	.246	.318	.212
Strategy: Action Plan – Funding -- External	.421	.150	**.820**	.288	.155	-.050
Strategy: Action Plan – Identif. of stkeholdrs	.691	.214	.537	-.072	-.021	-.086
Strategy: Action Plan – Role of each stkeholdr	.335	**.755**	.295	.174	.223	-.357
Strategy: Action Plan – Value on each stkeholdr	.179	**.825**	.417	.103	.147	-.116
Strategy: Action Plan – Promotion	**.887**	.169	.339	-.008	.171	.071
Strategy: Action Plan – Org. -- Leadership 1	**.894**	.076	.162	.109	.245	.254
Strategy: Action Plan – Org. -- Leadership 2	**.921**	.062	.073	.122	.245	.184
Strategy: Action Plan – Org. -- Leadership 3	**.734**	.293	.170	.385	.260	.174
Strategy: Action Plan – Org. -- Leadership 4	**.748**	.209	.054	.349	.126	.421

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 9 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 12.607, 2.823, 2.566, 1.857, 1.343 and 1.049

Final factor analysis

	Component				
	Motives – Challenges - Strategic Alignment – Leadership – Stakeholders	Promotion - Leadership	Accountability – Structure - Policies & Procedures	IT Strategy - Goals 1	Action Plan - Goals 2
IT Strategy	-.003	.361	.039	**.709**	.331
Strategy:Goals 1	.286	.283	.145	**.787**	.021
Strategy: Action Plan	.405	.004	.199	.497	**.667**
Strategy:Goals 2	.225	.287	.126	.145	**.818**
Strategy: Motives	**.853**	.159	.001	.019	-.095
Strategy: Challenges	**.828**	.055	.192	.295	.208
Strategy: Strtgic Align 1	**.517**	.485	.436	.320	-.208
Strategy: Strtgic Align 3	.343	.334	**.577**	.298	-.666
Strategy: Action Plan – Org. - Rsrce alloc	.101	.316	.221	.131	.055
Strategy: Action Plan – Org. - Accountability	.164	.430	**.835**	.059	.029
Strategy: Action Plan – Org. - Structure	.119	.417	**.643**	.042	.159
Strategy: Action Plan – Org. – Est. & imp of policies & procedures	.369	.033	**.758**	.356	.024
Strategy: Action Plan – Org. – Leadership	**.627**	.143	.194	.146	-.395
Strategy: Action Plan – Funding -- External	**.713**	.471	.123	.147	-.182
Strategy: Action Plan – Role of each stkeholdr	**.790**	.357	.295	.097	.233
Strategy: Action Plan – Value on each stkeholdr	**.853**	.216	.190	.144	.331
Strategy: Action Plan – Promotion	.356	**.879**	.115	.153	.138

Strategy: Action Plan – Org. -- Leadership 1	.163	**.879**	.218	.209	.058
Strategy: Action Plan – Org. -- Leadership 2	.092	**.918**	.214	.259	.021
Strategy: Action Plan – Org. -- Leadership 3	.221	**.646**	.301	.200	-.156
Strategy: Action Plan – Org. -- Leadership 4	.376	**.722**	.157	.067	.069

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 14 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 10.772, 2.374, 2.169, 1.564, 1.199 and 1.057

2. Processes

Initial factor analysis

	Component				
	Evaluation of Citizens & Employees Feedback	Business Process (Definition, Documentation, Streamlining, Vert. Integration)	Business Process Change (Motives, Focal Areas)	Evaluation of Employees' Use	Evaluation of Impact on Stakeholders
Processes: BPC	.163	-.233	**.529**	-.088	-.163
Processes: BPC – Motives of BPC	-.056	.188	**.941**	-.051	.098
Processes: BPC – Focal areas of BPC	-.436	.241	**.620**	.318	.467
Processes: BPC – Define BPs	-.001	**.765**	-.254	.131	.279
Processes: BPC – Document BPs	-.228	**.547**	.022	.204	-.122
Processes: BPC – Streamline BPs	-.288	**.881**	-.115	.074	.082
Processes: BPC – Vertical integration	.152	**.807**	.372	.274	-.059
Processes: BPC – Horizontal integration	.557	.652	.370	-.123	-.043
Processes: Evaluation	-.204	.352	-.186	.452	.087
Processes: Evaluation – Design/reality gap	.223	.531	.088	.421	.586
Processes: Evaluation – Use of citizens	**.748**	.061	.104	-.053	-.111
Processes: Evaluation – Use of employees	-.076	.012	.080	**.888**	-.120
Processes: Evaluation – Citizens feedback – PU	**.827**	.028	.013	-.172	-.073

Processes: Evaluation – Citizens feedback – PEOU	**.781**	.109	-.139	-.173	.132
Processes: Evaluation – Citizens feedback -- Stsfction	**.928**	-.006	-.194	-.045	.023
Processes: Evaluation – Citizens feedback -- Trust	**.928**	.077	-.244	-.019	-.152
Processes: Evaluation – Employees feedback – PU	**.916**	-.088	.191	-.043	.184
Processes: Evaluation – Employees feedback – PEOU	**.930**	-.086	.105	.013	.189
Processes: Evaluation – Employees feedback -- Stsfction	**.916**	-.098	.206	-.053	.167
Processes: Evaluation – Impact on stkhlders	.201	.011	.010	-.119	**.940**

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 10 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 7.300, 4.223, 2.178, 1.502, 1.377 and 1.081

Final factor analysis

	Component				
	Evaluation of Citizens Feedback	Business Process (Definition, Documentation, Streamlining, Integration)	Evaluation of Employees Feedback	Evaluation of Employees' Use	Business Process Change (BPC)
Processes: BPC	.145	-.470	-.016	-.056	**.527**
Processes: BPC – Motives of BPC	-.039	.099	.146	-.123	**.928**
Processes: BPC – Focal areas of BPC	-.115	.370	-.135	.231	**.711**
Processes: BPC – Define BPs	.144	**.893**	.006	.040	-.059
Processes: BPC – Document BPs	-.173	**.713**	.126	.363	.106
Processes: BPC – Streamline BPs	.004	**.852**	-.174	-.005	.064
Processes: BPC – Vertical integration	.250	**.757**	.197	-.076	.398
Processes: Evaluation – Use of citizens	**.536**	-.264	.169	-.538	.068
Processes: Evaluation – Use of employees	.183	.377	.129	**.754**	.227
Processes: Evaluation – Citizens feedback – PU	**.951**	-.015	.145	-.035	.104
Processes: Evaluation – Citizens feedback – PEOU	**.923**	.061	.142	.023	.071
Processes: Evaluation – Citizens feedback -- Stsfction	**.933**	.101	.125	.044	-.065
Processes: Evaluation – Citizens feedback -- Trust	**.941**	.124	.145	-.025	-.138

Processes: Evaluation – Employees feedback – PU	.308	-.015	**.931**	-.038	-.006
Processes: Evaluation – Employees feedback – PEOU	.301	-.005	**.923**	.003	-.062
Processes: Evaluation – Employees feedback -- Stsfction	.353	-.047	**.913**	-.064	.007
Processes: Evaluation – Impact on stkhlders	-.220	.051	**.622**	.065	.108

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 5.466, 4.116, 2.307, 1.987 and 1.449

3. Technology

Initial factor analysis

	Component				
	Website (No. of Services) - Security – H/W - Tech. Support (Reliability, Competence 1, Responsiveness, Timeliness, Comm. 1-4)	Info (Availability, Accuracy, Timeliness, Convenience, Vert. & Internet Integration) – Sys. Quality - Tech. Support (Comm. 3, Access)	Website (Content) - Tech. Support (Commitment)	Info (Horiz. Integration) - Tech. Support (Comm. 5)	Tech. Support (Competence 2)
Tchnlgy: IS Structure -- Info quality -- Content	-.492	.403	-.040	.413	-.016
Tchnlgy: IS Structure – Info quality -- Availability	-.258	**.713**	-.071	.241	-.091
Tchnlgy: IS Structure -- Info quality -- Accuracy	-.616	**.712**	-.044	-.048	-.070
Tchnlgy: IS Structure -- Info quality -- Timeliness	.134	**.622**	-.006	.317	-.225
Tchnlgy: IS Structre -- Info quality -- Convenience	-.398	**.638**	-.232	.468	-.332
Tchnlgy: IS Structure – Info quality – Vert. integ.	-.202	**.760**	-.182	-.173	.129
Tchnlgy: IS Structure – Info quality – Horiz. Integ.	-.004	.498	-.208	**.660**	-.282
Tchnlgy: IS Structure – Info quality – Intrnt integ.	.019	**.709**	-.003	-.241	.355
Tchnlgy: IS Structure – Info quality	-.492	**.559**	.268	.319	.166
Tchnlgy: IS Structure -- Sys. quality -- Reliability	-.576	**.683**	.149	-.104	.286
Tchnlgy: IS Structure -- Sys. quality -- Ease of use	-.534	**.716**	.210	-.240	.122
Tchnlgy: IS Structure -- Sys. quality -- Accessibility	-.735	**.586**	.049	-.023	-.019

Tchnlgy: IS Structure -- Sys. quality -- Usefulness	-.665	**.539**	.218	.104	.066
Tchnlgy: IS Structure -- Sys. quality -- flexibility	-.479	**.778**	.248	-.095	.232
Tchnlgy: IS Structure – Sys. quality – Vert. integ.	-.540	**.629**	.373	-.099	.191
Tchnlgy: IS Structure – Sys. quality – Horiz. integ.	-.293	**.706**	-.036	.392	.195
Tchnlgy: IS Structure – Sys. quality – Intrnt integ.	-.409	**.737**	.303	-.021	-.169
Tchnlgy: IS Structure -- Sys. quality	-.036	**.766**	-.101	-.200	.374
Tchnlgy: IS Structure – Web quality -- Usability	.552	.204	.614	-.140	.102
Tchnlgy: IS Structure – Web quality -- Layout	.565	.291	.002	-.035	-.116
Tchnlgy: IS Structure – Web quality -- Navigation	.564	.505	.106	-.491	.017
Tchnlgy: IS Structure – Web quality -- Consistency	.709	.097	.598	-.145	-.114
Tchnlgy: IS Structure – Web quality -- Content	.434	.242	**.568**	-.130	-.451
Tchnlgy: IS Structure – Web quality – No. of services	**.521**	-.141	.461	.283	-.159
Tchnlgy: IS Structure – Web quality -- Stge1	.736	.353	.017	.360	.185
Tchnlgy: IS Structure – Web quality -- Stge2	.676	-.038	.045	.503	-.019
Tchnlgy: IS Structure – Web quality -- Stge3	.073	-.252	.306	.073	.471

Tchnlgy: IS Structure – Web quality -- Stge4	.277	.511	-.127	.195	.064
Tchnlgy: IS Structure -- Web quality	.107	-.112	.600	.144	.177
Tchnlgy: IS Structure – Security -- Data protection	**.855**	-.100	.109	.375	.106
Tchnlgy: IS Structure – Security -- S/W protection	**.702**	-.320	.104	.183	.479
Tchnlgy: IS Structure – Security -- Data transfer	**.893**	.166	.163	.117	.127
Tchnlgy: IS Structure – Security -- Access prvlgs	.653	-.169	.670	-.017	-.138
Tchnlgy: IS Structure – Security -- Payment safty	.671	.545	.149	.117	.329
Tchnlgy: IS Structure – Security	**.834**	.114	.394	.021	-.101
Tchnlgy: IS Structure – H/W -- Quality	.632	.152	-.051	-.354	-.064
Tchnlgy: IS Structure – H/W – Vert. integ.	.568	.435	.007	-.091	-.169
Tchnlgy: IS Structure – H/W – Horiz. integ.	**.790**	.087	-.135	.371	-.200
Tchnlgy: IS Structure – H/W	**.796**	.193	.079	.182	-.060
Tchnlgy: Tech. Supp. & Dev. -- Reliability1	**.816**	.124	-.318	.059	.334
Tchnlgy: Tech. Supp. & Dev. -- Reliability2	**.817**	.301	-.289	.138	.234
Tchnlgy: Tech. Supp. & Dev. -- Reliability3	**.801**	.360	-.299	.107	.075
Tchnlgy: Tech. Supp. & Dev. -- Competence1	**.551**	.353	-.500	-.329	-.148

Tchnlgy: Tech. Supp. & Dev. -- Competence2	.417	-.088	-.510	-.162	**.529**
Tchnlgy: Tech. Supp. & Dev. -- Responsiveness	**.805**	.321	-.144	.065	-.019
Tchnlgy: Tech. Supp. & Dev. -- Timeliness1	**.703**	.322	-.459	-.026	-.100
Tchnlgy: Tech. Supp. & Dev. -- Timeliness2	**.684**	.341	-.353	-.054	-.073
Tchnlgy: Tech. Supp. & Dev. -- Comm.1	**.758**	.004	.068	-.400	.032
Tchnlgy: Tech. Supp. & Dev. -- Comm.2	.037	.509	-.231	-.224	-.146
Tchnlgy: Tech. Supp. & Dev. -- Comm.3	.340	**.630**	-.413	-.158	-.212
Tchnlgy: Tech. Supp. & Dev. -- Comm.4	**.658**	.485	.157	-.315	-.043
Tchnlgy: Tech. Supp. & Dev. -- Comm.5	.239	.352	-.172	**.520**	-.382
Tchnlgy: Tech. Supp. & Dev. -- Commitment	.186	.397	**.617**	-.152	-.121
Tchnlgy: Tech. Supp. & Dev. -- Access	.350	**.676**	.194	.218	-.031

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 9 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 17.389, 12.021, 4.929, 2.051 and 1.434

Final factor analysis

	Component				
	Security – Tech. Support	Info Quality – Sys. Quality	Info (Timeliness, Convenience, Vert. Integration)	Sys. (Hor. Integration) – Website (Content) – Tech. Support (Comm.)	Tech. Support (Commitment)
Tchnlgy: IS Structure – Info quality -- Availability	.314	**.734**	.190	.084	-.209
Tchnlgy: IS Structure -- Info quality -- Accuracy	-.046	**.841**	-.120	.250	-.140
Tchnlgy: IS Structure -- Info quality -- Timeliness	.218	.326	**.856**	.077	-.150
Tchnlgy: IS Structre -- Info quality -- Convenience	.039	.474	**.582**	.140	-.351
Tchnlgy: IS Structure – Info quality – Vert. integ.	.323	**.674**	.159	.163	.207
Tchnlgy: IS Structure – Info quality – Horiz. Integ.	.058	.174	.029	-.066	**.663**
Tchnlgy: IS Structure – Info quality – Intrnt integ.	.175	.154	**.659**	.209	-.095
Tchnlgy: IS Structure – Info quality	.275	**.747**	.244	-.215	-.300
Tchnlgy: IS Structure -- Sys. quality -- Reliability	-.105	**.893**	.081	.027	.081
Tchnlgy: IS Structure -- Sys. quality -- Ease of use	-.229	**.902**	.139	.156	.186
Tchnlgy: IS Structure -- Sys. quality -- Accessibility	-.215	**.904**	-.022	.061	-.148
Tchnlgy: IS Structure -- Sys. quality -- Usefulness	-.205	**.730**	.123	.032	-.084
Tchnlgy: IS Structure -- Sys. quality -- flexibility	-.136	**.921**	.067	.045	.094

Tchnlgy: IS Structure – Sys. quality – Vert. integ.	-.172	**.867**	-.128	-.016	.339
Tchnlgy: IS Structure – Sys. quality – Horiz. integ.	-.059	.292	.012	**.517**	.161
Tchnlgy: IS Structure – Sys. quality – Intrnt integ.	-.127	**.633**	.458	.108	-.041
Tchnlgy: IS Structure -- Sys. quality	.396	**.732**	.259	.160	-.149
Tchnlgy: IS Structure – Web quality -- Content	.176	.081	.126	**.588**	.110
Tchnlgy: IS Structure – Web quality – No. of services	.254	-.189	**.770**	-.164	.042
Tchnlgy: IS Structure – Security -- Data protection	**.873**	-.261	-.017	-.259	.077
Tchnlgy: IS Structure – Security -- S/W protection	**.699**	-.336	.013	-.337	-.033
Tchnlgy: IS Structure – Security -- Data transfer	**.915**	-.050	.084	-.041	.268
Tchnlgy: IS Structure – Security	**.579**	-.264	.246	-.007	.516
Tchnlgy: IS Structure – H/W – Horiz. integ.	**.823**	-.218	.052	.074	-.119
Tchnlgy: IS Structure – H/W	**.873**	.014	-.164	.108	.021
Tchnlgy: Tech. Supp. & Dev. -- Reliability1	**.928**	-.039	-.033	.091	.049
Tchnlgy: Tech. Supp. & Dev. -- Reliability2	**.937**	.045	.148	.148	-.008
Tchnlgy: Tech. Supp. & Dev. -- Reliability3	**.861**	.013	.333	.278	-.029
Tchnlgy: Tech. Supp. & Dev. -- Competence1	**.626**	.040	.095	.697	-.118

Tchnlgy: Tech. Supp. & Dev. -- Competence2	**.741**	.126	-.104	.139	-.336
Tchnlgy: Tech. Supp. & Dev. -- Responsiveness	**.801**	-.025	.447	.166	.010
Tchnlgy: Tech. Supp. & Dev. -- Timeliness1	**.744**	-.070	.338	.335	-.095
Tchnlgy: Tech. Supp. & Dev. -- Timeliness2	**.795**	.117	.240	.222	.010
Tchnlgy: Tech. Supp. & Dev. -- Comm.1	**.679**	-.103	.087	.299	.321
Tchnlgy: Tech. Supp. & Dev. -- Comm.3	**.526**	.300	.367	.447	-.221
Tchnlgy: Tech. Supp. & Dev. -- Comm.4	**.555**	.286	.378	.314	.305
Tchnlgy: Tech. Supp. & Dev. -- Comm.5	.290	.320	.037	**.845**	-.002
Tchnlgy: Tech. Supp. & Dev. -- Commitment	.079	.107	-.227	-.066	**.919**
Tchnlgy: Tech. Supp. & Dev. -- Access	**.676**	.504	.040	-.010	-.014

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 16 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 13.369, 10.329, 2.773, 2.292 and 1.421

4. People

Initial factor analysis

	Component		
	HR Training & Development	Impact - Adapt. To Change Skills	Skills
People: US	.473	.413	.287
People: Impact on employees	.264	**.760**	.167
People: Skills – Adapt. to change	.078	**.868**	.167
People: Skills – Integration	.142	.157	**.919**
People: Skills – Cust. Serv.	-.043	.279	**.849**
Like Computers	.043	**.798**	.142
People: HR Train. & Dev.1	**.878**	.265	.160
People: HR Train. & Dev.2	**.852**	.211	.154
People: HR Train. & Dev.3	**.751**	.451	.062
People: HR Train. & Dev.4	**.908**	.159	.140
People: HR Train. & Dev.5	**.850**	.087	.117
People: HR Train. & Dev.6	**.791**	-.012	-.115
People: HR Train. & Dev.7	**.815**	-.025	-.116

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 6.106, 2.448 and 1.093

Final factor analysis

	Component		
	HR Training & Development	Impact - Adapt. To change Skills	Skills
People: Impact on employees	.246	**.709**	.159
People: Skills – Adapt. to change	.090	**.873**	.164
People: Skills – Integration	.140	.145	**.916**
People: Skills – Cust. Serv.	-.037	.288	**.858**
Like Computers	.055	**.823**	.154
People: HR Train. & Dev.1	**.879**	.264	.160
People: HR Train. & Dev.2	**.858**	.222	.162
People: HR Train. & Dev.3	**.759**	.459	.070
People: HR Train. & Dev.4	**.908**	.163	.134
People: HR Train. & Dev.5	**.852**	.099	.111
People: HR Train. & Dev.6	**.788**	-.026	-.122
People: HR Train. & Dev.7	**.808**	-.038	-.113

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 4 iterations.
Loading rule: Choose loading number greater than 0.5 on one factor, and less than 0.5 on all others.
Eigenvalues: 5.692, 2.399 and 1.090

II. Correlations

1. **Strategy**

		Motives – Challenges - Strategic Alignment – Leadership – Stakeholders	Promotion - Leadership	Accountability – Structure - Policies & Procedures	IT Strategy - Goals 1	Action Plan - Goals 2
Motives – Challenges - Strategic Alignment – Leadership – Stakeholders	Pearson Correlation	**1**	**.013**	**.117**	**.189**	**.104**
	Sig. (2-tailed)		.958	.666	.483	.702
	N	18	18	16	16	16
Promotion - Leadership	Pearson Correlation	**.013**	**1**	**.184**	**.397**	**.120**
	Sig. (2-tailed)	.958		.484	.128	.658
	N	18	18	16	16	16
Accountability – Structure - Policies & Procedures	Pearson Correlation	**.117**	**.184**	**1**	**.421**	**.019**
	Sig. (2-tailed)	.666	.484		.104	.945
	N	16	16	16	16	16
IT Strategy - Goals 1	Pearson Correlation	**.189**	**.397**	**.421**	**1**	**.087**
	Sig. (2-tailed)	.483	.128	.104		.749
	N	16	16	16	16	16
Action Plan - Goals 2	Pearson Correlation	**.104**	**.120**	**.019**	**.087**	**1**
	Sig. (2-tailed)	.000	.984	.711	.455	.989
	N	16	16	16	16	16

** Correlation is significant at the 0.01 level (2-tailed).

2. Processes

		Evaluation of Citizens feedback	Business Process (definition, documentation, streamlining, integration)	Evaluation of employees feedback
Evaluation of Citizens feedback	Pearson Correlation	**1**	**.047**	**.295**
	Sig. (2-tailed)		.861	.267
	N	16	16	16
Business Process (definition, documentation, streamlining, integration)	Pearson Correlation	**.047**	**1**	**.099**
	Sig. (2-tailed)	.861		.714
	N	16	16	16
Evaluation of employees feedback	Pearson Correlation	**.295**	**.099**	**1**
	Sig. (2-tailed)	.267	.714	
	N	16	16	16

3. Technology

		Security – Tech. Support	Info Quality – Sys. Quality	Info Timeliness, Convenience, & Vert. Integration	Sys. Hor. Integration – Web Content – Tech. Support Communication	Tech. Support Commitment
Security – Tech. Support	Pearson Correlation	**1**	**.038**	**.067**	**.153**	**.448(*)**
	Sig. (2-tailed)		.839	.720	.412	.011
	N	31	31	31	31	31
Info Quality – Sys. Quality	Pearson Correlation	**.038**	**1**	**.170**	**.536(**)**	**.458(**)**
	Sig. (2-tailed)	.839		.361	.002	.010
	N	31	31	31	31	31
Info Timeliness, Convenience, & Vert. Integration	Pearson Correlation	**.067**	**.170**	**1**	**.347**	**.243**
	Sig. (2-tailed)	.720	.361		.056	.189
	N	31	31	31	31	31
Sys. Hor. Integration – Web Content – Tech. Support Communication	Pearson Correlation	**.153**	**.536(**)**	**.347**	**1**	**.427(*)**
	Sig. (2-tailed)	.412	.002	.056		.017
	N	31	31	31	31	31
Tech. Support Commitment	Pearson Correlation	**.448(*)**	**.458(**)**	**.243**	**.427(*)**	**1**
	Sig. (2-tailed)	.011	.010	.189	.017	
	N	31	31	31	31	31

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

4. People

		HR Training & Development	Impact - Adapt. To change Skills	Skills
HR Training & Development	Pearson Correlation	**1**	**.372**	**.159**
	Sig. (2-tailed)		.060	.334
	N	39	39	39
Impact - Adapt. To change Skills	Pearson Correlation	**.372**	**1**	**.223**
	Sig. (2-tailed)	.060		.150
	N	39	43	43
Skills	Pearson Correlation	**.159**	**.223**	**1**
	Sig. (2-tailed)	.334	.150	
	N	39	43	43

* Correlation is significant at the 0.05 level (2-tailed).

III. Reliability

Constructs	Cronbach's Alpha	Dimensions	Cronbach's Alpha
Strategy	0.9055	Motives – Challenges - Strategic Alignment – Leadership – Stakeholders	0.9334
		Promotion - Leadership	0.9285
		Accountability – Structure - Policies & Procedures	0.9307
		IT Strategy - Goals 1	0.9221
		Action Plan - Goals 2	0.9534
Processes	0.8996	Evaluation of Citizens feedback	0.9019
		Business Process (definition, documentation, streamlining, integration)	0.8896
		Evaluation of employees feedback	0.9012
Technology	0.9122	Security – Tech. Support	0.9256
		Info Quality – Sys. Quality	0.9138
		Info Timeliness, Convenience, & Vert. Integration	0.9296
		Sys. Hor. Integration – Web Content – Tech. Support Communication	0.9007
		Tech. Support Commitment	0.9221
People	0.9199	HR Training & Development	0.9105
		Impact - Adapt. To change Skills	0.9232
		Skills	0.9563
EGR	0.9512	EGR	0.9834

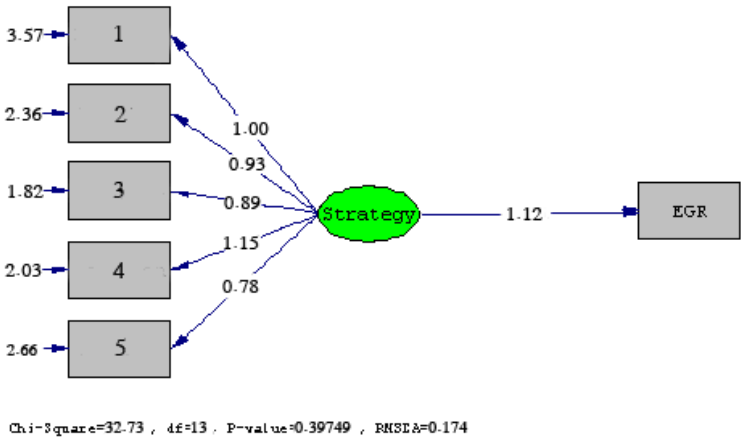
IV. Convergent Validity

Construct	Dimension	Correlations range	Significant level
Strategy	Motives – Challenges - Strategic Alignment – Leadership – Stakeholders	(0.688, 0.912)	0.05 (2-tailed)
	Promotion - Leadership	(0.771, 0.966)	0.01 (2-tailed)
	Accountability – Structure - Policies & Procedures	(0.652, 0.855)	0.05 (2-tailed)
	IT Strategy - Goals 1	(0.671, 0.900)	0.05 (2-tailed)
	Action Plan - Goals 2	(0.754, 0.972)	0.01 (2-tailed)
Processes	Evaluation of Citizens feedback	(0.713, 0.975)	0.01 (2-tailed)
	Business Process (definition, documentation, streamlining, integration)	(0.701, 0.944)	0.01 (2-tailed)
	Evaluation of employees feedback	(0.721, 0.968)	0.01 (2-tailed)
Technology	Security – Tech. Support	(0.699, 0.984)	0.01 (2-tailed)
	Info Quality – Sys. Quality	(0.714, 0.966)	0.05 (2-tailed)
	Info Timeliness, Convenience, & Vert. Integration	(0.696, 0.978)	0.01 (2-tailed)
	Sys. Hor. Integration – Web Content – Tech. Support Communication	(0.637, 0.901)	0.05 (2-tailed)
	Tech. Support Commitment	(0.684, 0.912)	0.01 (2-tailed)
People	HR Training & Development	(0.744, 0.986)	0.05 (2-tailed)
	Impact - Adapt. To change Skills	(0.715, 0.967)	0.05 (2-tailed)
	Skills	(0.724, 0.950)	0.05 (2-tailed)

V. Partial Models

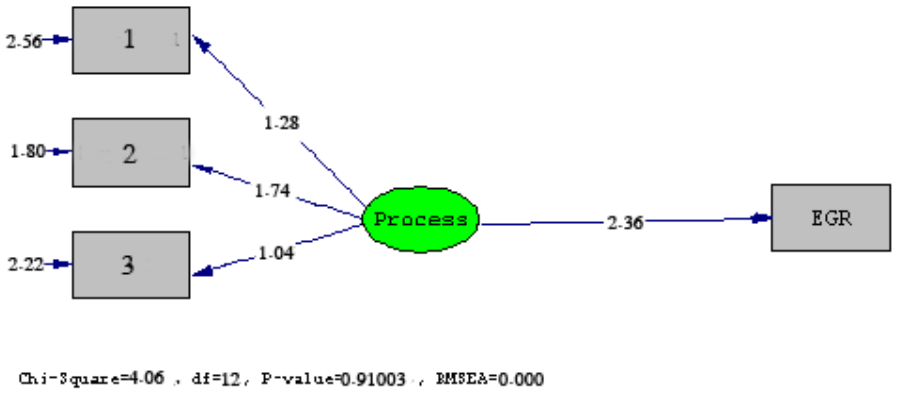
Hypothesis 1 (H1): E-government strategy impacts EGR of the organisation

Using EGR as the dependent construct and Strategy as the independent construct in the partial model, the results display a modest fit to data (x^2 = 32.73, df = 13, *P*-value = 0.39749).



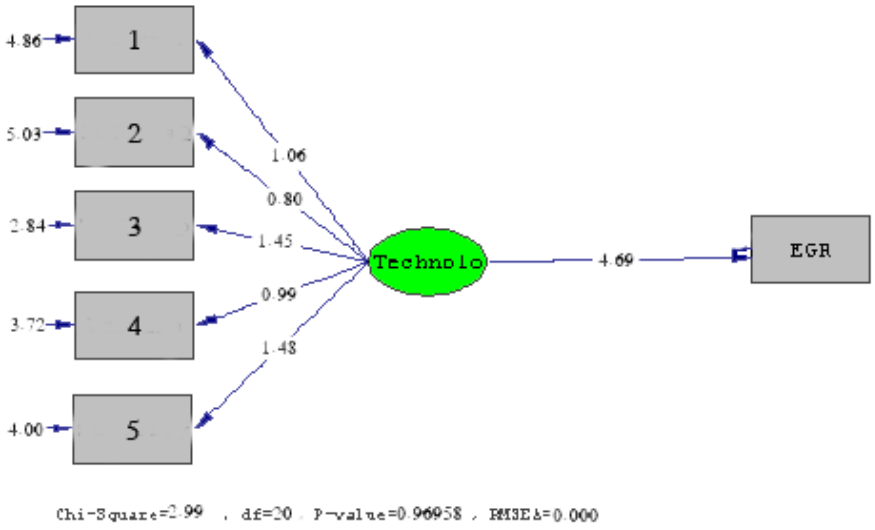
Hypothesis 2 (H2): Organisation's processes impacts its EGR

Using EGR as the dependent construct and Process as the independent construct in the partial model, the results display a high fit to data (x^2 = 4.06, df = 12, *P*-value = 0.91003)



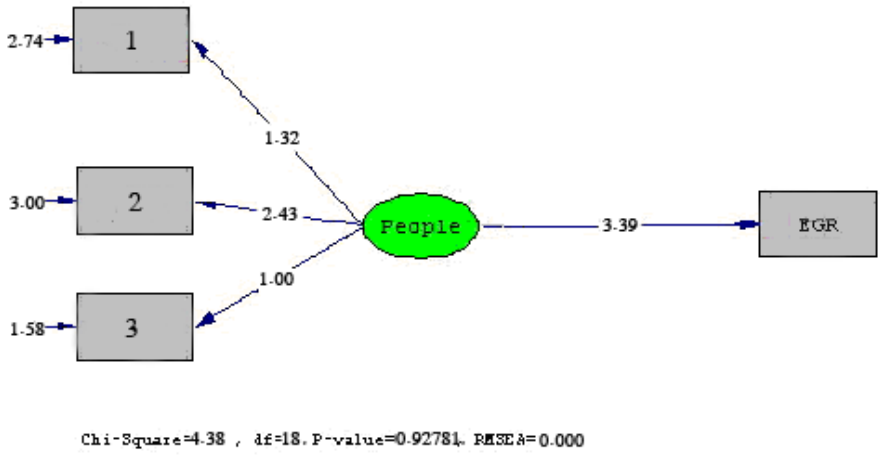
Hypothesis 3 (H3): Technology in the organisation impacts its EGR

Using EGR as the dependent construct and Technology as the independent construct in the partial model, the results display a high fit to data (x^2 = 2.99, df = 20, *P*-value = 0.96958).



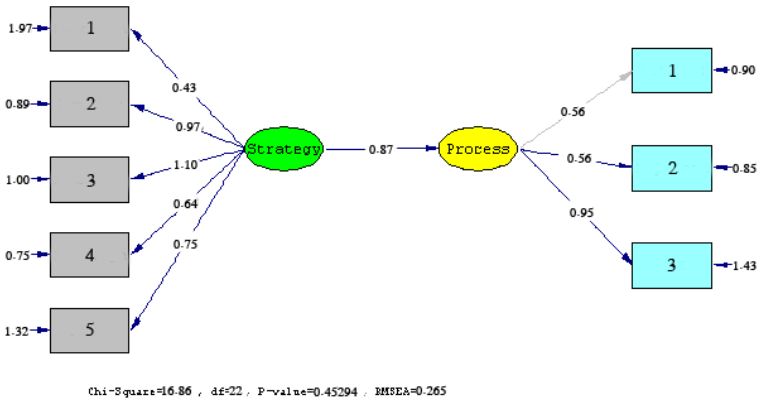
Hypothesis 4 (H4): People in the organisation impacts its EGR

Using EGR as the dependent construct and People as the independent construct in the partial model, the results display a high fit to data (x^2 = 4.38, df = 18, *P*-value = 0.92781).



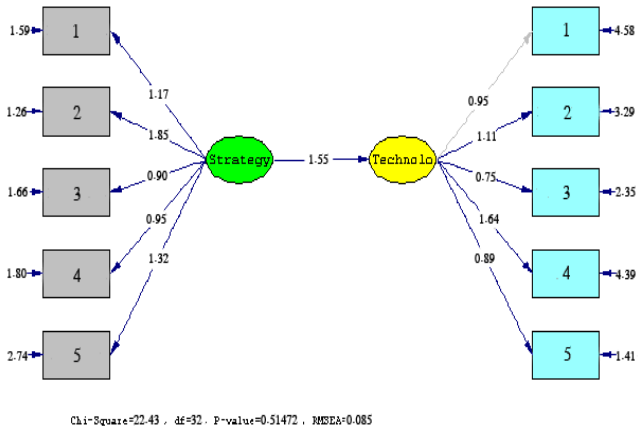
Hypothesis 5a (H5a): E-government strategy impacts processes in the organisation

Using Process as the dependent construct and Strategy as the independent construct in the partial model, the results display modest fit to data (x^2 = 16.86, df = 22, *P*-value = 0.45294).



Hypothesis 5b (H2): E-government strategy impacts technology in the organisation

Using Technology as the dependent construct and Strategy as the independent construct in the partial model, the results display modest fit to data (x^2 = 22.43, df = 32, *P*-value = 0.51472).



Hypothesis 5c (H5c): E-government strategy impacts people in the organisation

Using People as the dependent construct and Strategy as the independent construct in the partial model, the results display a high fit to data (x^2 = 5.73, df = 18, *P*-value = 0.90532).